# NEW WORLDS SCIENCE FICTION

No. 67
VOLUME 23
2/-

★ RUSSIA'S FIRST MANNED SATELLITE ★

# Peter Phillips

London

Born on the Isle of Dogs thirty-five years ago, Peter Phillips was originally destined by his parents for a scientific career which he foresook for the somewhat more precarious pastime of journalism, obtaining his groundwork in a West Country newspaper. From rural England to the bustle of Fleet Street was a natural step, where he is now chief sub-editor of the features section on the *Daily Herald*—albeit not situated in printer's Row any longer.

It was also a natural progression of events that turned him to writing science fiction, still one of his favourite forms of relaxation although his newspaper commitments leave him little time for writing many stories. However, in a four-year burst of literary endeavour between 1948 and 1952 he produced over thirty science fiction and detective stories all of which quickly put him in the forefront of demand from American editors looking for new writers who could present science fiction themes in a better and more interesting manner.

Since then an occasional story has been published from him of which "Next Stop The Moon" in this issue is his only 1957 contribution. It was written to a publishing deadline less than 24-hours after Sputnik One went into orbit.

We personally hope that it will take less than the first manned satellite or Man on the Moon to get him to produce more stories of the usual high Phillips' standard.

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Editor : JOHN CARNELL

Cover Painting by TERRY from " Next Stop The Moon "
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# Happy New Year

It is not often that this Editorial is used to discuss our own magazines—only four times in the last forty issues, as a matter of fact—mainly because I have never seen the necessity of ' beating the drum ' to our own readers. Such publicity being diverted to other channels where it is likely to produce new readers. Both *New Worlds* and *Science Fantasy* are quite capable of speaking for themselves. Therefore, unless I have had anything specific to say about policy, I have preferred to devote these two pages to matters of general interest in the science fiction field.

As we enter 1958, however, the new year looks particularly attractive from our viewpoint, and I would like you to know that there are some extremely interesting things being planned for your entertainment. Not the least of these being many stories with a " different " outlook. One of the most profound statements John W. Campbell, Jr., made at the recent World Science Fiction Convention was that science fiction magazines were clearing houses for new ideas and that the stories of today would not be representative of the term " science fiction " in ten year's time. The genre has been changing steadily over the years and will obviously continue to do so.

Magazine editors are only the people who control the flow of ideas from the authors and I personally maintain that as soon as an editor becomes hidebound in his requirements he will have carved a rut from which it will be impossible to escape.

A glance through this issue will point up this contention. The stories by Brian Aldiss and Peter Phillips are completely different from the normal type of presentation, yet are still written around ideas which have been used many times before. John Brunner's serial is another case in point, only more so, as he has more than one idea running at a time.

This constant change in science fiction will become more apparent as time goes on and I am quite convinced that *New Worlds* at least will be playing its usual forceful part in helping to make that change. For instance, in the February published issue we shall be commencing a serial by Eric Frank Russell —a new novel which will only appear in book form elsewhere (in January in the USA and May in Great Britain). Russell

has been tradition breaking for many years and this new story is no exception. It ties in well with our search for the " new look " in science fiction.

This same issue will probably see something quite different in the way of cover pictures, too, as we have gradually been working up to the idea that abstract art is an expressionistic medium readily adaptable to stories of the future. I am of the opinion that science fiction magazines now need something more than the accepted form of spaceship cover or prosaic action-adventure illustration. We shall see how the new ideas develop.

Which leads me to my recent remarks in the August issue concerning the lack of interior illustrations in the Nova magazines. I didn't expect any storm of protest over our policy of dropping illustrations and I wasn't disappointed. In point of fact the dissenting voices, at least within the Commonwealth, have been so few as to be virtually non-existent.

However, numerous American readers have leapt to the defence of the interior illustration and a short article appeared in the October issue of *Science Fiction Times*, written by J. Harry Vincent, championing the cause and quoting me as being " off the beam " for my decision. " A magazine without interior art," he writes, " is only half a magazine. The page after page of pure type is hard and boring to the readers in general." The same statement, presumably, doesn't apply when reading a book, which normally contains twice as many pages as a magazine—yet book publishers abandoned illustrated plates thirty years ago.

Mr. Vincent's summation of the " failure of modern science fiction magazines " (and this at a time when more new titles are due to be published in America) is " the lack of art work, readers' columns and good fan departments." American editors, apparently, are falling over themselves to obtain all three so that they may stay in business.

Traditions die extremely hard—the last place these particular ones will perish is in the USA where they originated, but pass away they will if for no other reason than economical pressure as production costs continue to rise. Meanwhile, we might as well go on searching for the " new look " this side of the Atlantic.

*John Carnell*

*Kenneth Bulmer's setting for this story is against a heavy-gravity planet where it would be almost impossible for a human being to land. Consequently, all mining operations are done by remote control with robot equipment. Introduce robot controls in place of the human element to operate the surface robots—and the answer is* trouble.

# NEVER TRUST A ROBOT

## By Kenneth Bulmer

---

Men from Earth had called the planet Narberth. There were few who knew the origin of that name and less who cared. The mythology of the old British gods still existed in this age of Galactic expansion for those who had heart and ear for the old legends. For those who knew then. Narberth, the Celtic palace of Pwyll, Prince of Dyfed who yet a mortal was hailed as the Head of Hades, was a fitting name for this alien, grotesquely swollen and repulsively beautiful planet.

The men from Earth had felt no compulsion to call this treasure-world Hell—there were far more terrible planets on file—but they had sensed that, like the olden-time palace of Narberth, it was on the brink of Hades.

So that, when the Mining Companies sent out their ships and men and placed bases in orbit around Narberth and began filtering the oceans for treasure through the electronic devices operated at long distance from those orbiting bases, it was natural that the men employed by the Companies should turn inwards for amusement and a sense of living, and not think twice of the swirling, hostile planet that gave them their living. Not think of it objectively, that is, until their senses were down there on that rolling surface.

Bill Costain, guiding the skater down into the swathing poison belts, although he knew and loved the old legends had no time now to think of anything save a frantic attempt to cushion the imminent crack-up. As soon as he'd felt the controls fight the gentling of his hands he'd known there was going to be a crack-up at the end of this trajectory.

As, of course, one day there was inevitably bound to be.

The old simmering anger at the pinch-penny company policy of rejecting without argument any suggestion that it might be wise to use automatics threatened to erupt, now that the crisis had come, into a jangling nerve-block. Deliberately, he channelled his anger into productive work, concentrating on using every remaining second to prevent the unpreventable.

From the assistant position in skater control, young Ralph said : " Two strangers. Six o'clock and directly below, opposition courses. Non-interception flight paths."

" Thanks." Costain had even less time to waste on the skaters of rival companies mining the wealth of Narberth. He said : " This bird's going to crash. Prognosis definite. Get Borden on the line, will you, Ralph."

" Wilco, Bill."

Ralph was more than a little of a firebrand, always ready to fight for a cause, and to invent an excuse if one lacked. Although he was, for a spaceman, relatively uneducated, he exerted a peculiar compulsion upon the crew's collective feelings. And he was a good assistant.

Sitting up here in skater control of the base ship, dictating through electronic relays every movement of complicated machinery far below on the surface, always had seemed to Costain to smack of Godhood. He saw no blasphemy in that way of looking at his job ; God knew he hadn't wanted it when his life had gone wrong and it was all that offered.

He carried out a final check, measuring each dial with his eye, computing, weighing chances. It was black and white. This skater was going to crack-up. Completely.

His hands in the control gloves, from which impulses sped to the slave controls aboard the skater, seemed possessed of a life of their own ; they rebelled when he dictated a flight path which could end only in catastrophe. He smiled tiredly. Then he let his brain take over, made the necessary alterations in course and sat back to wait for Borden.

Even then, he could not cut his senses from the skater dropping below onto the sea of Narberth, even though his body relaxed in the control chair aboard the base ship, orbiting outside the amosphere. That had been, perhaps, man's greatest achievement on this planet. Narberth was nearly all ocean, with occasional craggy outcroppings poking reluctantly above the swell, reminders of the sunken continents below, and to drain and filter the water for its radioactives and rare metals had demanded a level of technology which the scientists of the Mining Companies had struggled grimly to attain. They had constructed pumping plants on those rocky outcroppings, jetties for the tugs, berths for the skaters, strong, low buildings housing the relay equipment. They had erected screens to give a view of all phases of production. They had transferred the power of man to the surface without need of his body. And still they were not satisfied.

The skater burst through the filmy remnants of the upper vapour levels and at once, far below, Costain could see the limitless expanse of grey and green and brown ocean that rolled forever around Narberth. No cheerful sunlight winked back at him from the low, rounded crests of waves ; no sea-foam glimmered spectral ; no sea-bird's wing cut a dancing pattern against the smooth wave mountain's flanks. He was seeing only by courtesy of infra-reds, and even that seeing lacked the brilliance of a sun-bathed world.

The sea and sky-scape was enormous. It seemed to ring like some vasty hollow bowl and in all that sea and sky only the metal dot of his skater intruded like a fly caught on a motion-picture screen.

Costain had been flying skaters until he could put one down on the surface and read a sensi-tape at the same time. Whilst the company—the Maurice G. King Extra-Terrestrial Produce Company, with suitable genuflections—persisted in their

tight-wad system of using human operated equipment on a world totally unsuitable for human life, they must expect occasional losses. So far, Costain had been lucky ; the luck that clings to those who are meticulous about periodic checks, who don't believe taking a senseless chance is accepting a calculated risk and who keep themselves fit and up-to-date with technical development.

But, one day, the luck would run out. Often, before, the sense of outrage that filled him when he considered Borden, the base-ship manager's adamant refusal to take considered estimates back to Maurice G. King, had been strong enough to make him, briefly and insanely, allow the temptation to plunge a skater bodily beneath the surface to overpower his sense of proportion and ethics. And, always, the system prevailed. That beautiful system. That system which operated through carefully worded contracts, stipulating that the production of a team should be filled from the machines working below, pumping and sieving the rare metals from the ocean of Narberth. That system which calmly laid down that the quotas must be filled before the term of service expires. Production and length of service were nicely balanced.

If a team did not produce its quota—why, then, the men just stayed working away above Narberth until it did, or until one died ; whichever was the sooner.

Costain had never really stopped laughing at himself since the day he'd discovered that kicker in the contract. It had tickled his sense of decency into a negative response ; he'd had no idea a man could so lust for wealth and power that he would deliberately cause another man suffering. It just didn't make sense in a culture that, in spreading out from Earth, sincerely believed it had eradicated its own faults and was now fit and ready for the stars.

And for the wealth the stars could bring.

Borden's voice, smooth and refined and seeming to smell of after-shave lotion, brought out the usual goose-pimples on Costain. Borden said : " All right, Costain. I'm here. What's the trouble ? "

" Who's the best skater-flier with the company, Borden ?"

Borden laughed. " Fishing for compliments, Costain ?"

" You really mean that ?"

" Yes. You know damn well no-one can touch you." Borden sounded cautious. " What's the peeve ?"

"This bird's going to crack-up. Going to plough right in and go under. I thought you'd like to see it."

"I don't believe that."

"What you believe, Borden, makes no difference to what is going to happen." Costain was drained of anger; he had given up beating his head against stupidity. Maybe he was a moral coward; maybe he was just tired and wanted to fill his quota and go back to Earth. "I checked her before she dropped away from base and she checked out triple-A. But—something failed. It could have been anything. Now, if you'd had automatics—"

"Don't go into that again, Costain. Just concentrate on putting that skater down in one piece." Borden's smoothness crumpled. "It'll put you way back on your production schedule. You know what that means."

Costain just didn't bother to answer.

Ralph said: "If Bill says she'll crash, why, then I guess she will, Mr. Borden."

Borden said something to Ralph which elicited a little gasp. Costain heard Ralph leave, angrily. Then he decided that the time had come to put everything he knew into flying the skater down onto the ocean. He knew there would be a crack-up; the control panels didn't lie; but, being a human-cussed-being, he'd try to bypass that prediction somehow and bring the skater in in one piece. It was a pretty forlorn hope; but the human race had got along on forlorn hopes for a good many thousand years now. They'd still be using forlorn hopes when the next Galaxy was being opened up.

Skaters were the usual sort of compromise dreamed up to fill a number of different purposes in one vehicle. They were efficiently streamlined, with deep-hulled frames that could store tons of cargo—the rare metals dredged from the sea—they had scimitar wings, long and slender with cunning bracing internally that could support the wings and their cooling systems. That the wings couldn't lift a skater didn't enter into the equation. They were there merely to allow the pilot to bring the ship down in a long curve, using the atmosphere as a brake, and to give enough lift for the final landing manoeuvre.

The hop-skip and jump technique.

Certainly, it worked fine. You had a planet which was nearly all ocean and possessing a gravity twice that prevailing

in general upon Jupiter back in the Solar System. No man, obviously, could work efficiently down there, even if there existed mechanisms which allowed him merely to live on the surface. So, if your company wanted to bring back the wealth abounding there, it didn't bother with expensive rockets for braking, or parachutes, either drag or ribbon. It wouldn't provide gyro-vanes either. No—it would do what the Maurice G. King outfit, in common with all the other companies operating above Narberth, did. Let men fly skaters down, to come screaming in through the atmosphere and slide, carooming, over the waves, to come to a sea-borne landing. In short, it would use the hop-skip and jump technique.

Once down, the skaters would be towed by surface ships to the dredging and filtering machines, loaded up and then boosted back up by atomic rockets. Those could cut off when orbital velocity had been reached and, because of their low speed component, drift down on a mass of parachutes.

All very simple and cheap.

Even then, the cheapest component of the whole system was the manpower bill.

Under that load of gravity, the waves rolled, flat and misshapen to the eyes of a man accustomed to the steep chop of Earthly waves in the Channel or the mile long, slow and beautiful rollers of the wide Pacific. These rollers of Narberth surged relentlessly on, ten, twenty miles from crest to crest, their flanks like smooth coppered steel. Wind flicked ridiculously small spindrift, shrivelled and quickly falling, like the pattering of dead birds.

The trick was to pick a good wide trough between crests and ride down the slope, letting the keel bite gently, feeling the check, the—in theory—gradual slackening of that whirlwind speed which had carried the skater in from space, and then to surge up the opposite slope. Again in theory, the skater would plough to a standstill at the far crest and become just a powerless ship, adrift on the sea, waiting for tugs to fuss her into port.

In theory.

Many skater-fliers preferred to slide their birds in along the troughs, relishing the extra safety afforded by the relatively limitless watery runway. Costain had always considered this the kiddies method ; not without reason. You had no final drag check there, not in the same way you had when your

bird started to glide *up* the opposite trough wall against all that awful gravity. And you could always dip a wing . . .

Borden was breathing hard somewhere in the background and Costain even found a little thankfulness in him that he was at the controls of a bird, able, for these moments, to cut himself off from the base manager's overbearing presence. He held the control column in that deceptively soft-looking grip. Other fliers had said that even if there weren't servo-couples on ailerons and rudders, Bill Costain's fingers could hold the control surfaces steady and smooth. He had been watching his meters during the whole of his staccato, bitter conversation ; now he felt absolute certainty that a crash was unavoidable. Carefully, he eased the stick back.

The skater responded magnificently. She lifted her nose, fighting to plane out into a normal landing glide. Costain could feel wind tremors battering through the dampers. Only a heavy, solidly built ship could hope to retain any semblance of control or freedom of manoeuvre in the gales that haphazardly swept across the liquid face of Narberth. No ship that could make any sort of true landing swinging beneath parachutes or gyro-vanes would be heavy enough to fight those gusts.

" Can you hold her ?"

Costain mumbled something in reply to Borden. The manager believed, now. He, too, could read the story told by the speedometers, altimeters, machmeters and rate-of descent dials. That story built up. The long marching rollers below jinked crazily as the ship rolled, her scanners rotating to compensate. Bearing down on her, putting on the pressure of his skills and knowledge, Costain straightened her up, eased her flight path, gentled her like an unbroken colt to the leading halter.

Brown and golden and blue, the sea streamed past beneath. When it appeared to be so close as to become merely an unfocussed mass Costain reduced magnification and the screens flicked back to show the true height of the skater.

" Too low," Costain said flatly. " Too fast."

Around the ship now the roaring of the wind was catching up. Her vibrating parts hummed with their battle against gravity and windforce but her sound was miles to the rear. Sea and waves unreeled in a nightmarish vertigo. The thermo-couples had mostly blown and those that still functioned showed impossibilities. The sea reached up, hungrily.

If he could just ease her a trifle more and then, on the last millisecond of flight, jink her up, she might respond. She might lift her nose and drop her tail, like a duck, sit herself down, slice herself through the water which at those speeds would be like cast tungsten, and flop into some sort of planet-fall. It was worth trying. Anything was worth trying.

Costain let her head down.

Borden reached a thick arm across him, squat competent fingers closed over his own on the control column, pressed back. Sheer disbelief robbed Costain of any immediate response and in that second of inaction, Borden had hauled the stick back, brought the bird's nose up.

"What d'you think you're doing—?"

"Shut up, Costain."

"You can't—"

The skater responded. Her nose struggled up. She shook herself like some great hunted animal with the hounds baying her flanks. She lifted. In the forward screens Costain saw the horizon appear, at that low height a single steel grey incurved line from the effects of a trough. She might do it. Going in like this, the kiddies way, along a trough with all the bulk of the planet to come to rest in, she might do it.

"That's the way to fly a bird!" Borden said thickly.

Costain licked his lips. And, in that moment of self-hatred, the skater dropped. She put her nose down and went in cleanly, like a kingfisher with only the thought of a fish in his mind.

Briefly, brown and then blue and black flowed over the forward screens. Costain had the overpowering impression of the immensity of the sea groping up for him. Coldness seemed to seep into his bones. Then radio contact failed and the screens went dead.

He pushed the control column away from him. He put both hands flat on the board and watched them with comical seriousness as the trembles vibrated the brown skin. He could feel nothing. Then the back of his neck ached and he found surprise that he could lift a hand and rub it. He breathed in deeply and then swivelled on the chair, thrust his legs out and stood up. He looked at Borden.

Skater control was silent. Machinery hummed somewhere and the air circulation fans chittered. But those sounds would be noticed only if they stopped.

"So you lost her, Costain."

Costain did not smile. He did not move a muscle of his face. He pushed past Borden and went through skater control unseeingly and stumbled into his bunk and stretched out flat. He had never lost a bird before. But he knew that it was no mere loss that had affected him like this, no mere interference on the part of the base manager, no mere bitterness in the knowledge that he would have to work that much longer to fill his teams' quota and be free of Narberth.

Something in the senseless anti-humanism of Borden, of the whole company set-up, had burrowed like a maggot deep into his mind.

Presently, the door chimed and Ralph's voice said hesitantly : " Bill ? Can I come in ? "

" Come."

When they had lighted selfigs and drawn in the first sweet lungsful of smoke, Ralph said earnestly : " Borden overstepped himself that time, Bill. When you take a skater down, you're the skipper. No-one can usurp that authority."

Costain smiled wryly, the first show of emotion he had allowed himself since the crack-up. " You know better than that, Ralph."

" Yes. I guess so." The youngster pushed his big hand through his fair, unruly hair. He looked unhappy. " Why the company won't install automatics I can't understand. We all know they'd pay for themselves in a decade or so."

" Maybe Maurice figures he won't be around in ten years' time to collect."

" Him ! The old harpie will live out his allotted five score years and ten and then some."

" And we'll still be working on Narberth, trying to make our quota, is that it ?"

" My God, I hope not ! I've plans when I get back to Earth."

" All the same, Ralph, there must be some reason why the company won't install automatics." He blew smoke contemplatively. Already he was feeling better. " Some of the other companies have them and they're doing all right."

Ralph began to look uncomfortable. He shifted around on the formfit. Costain, half sitting on his bunk, stared at him, and then said : " All right, Ralph. Let's have it. What's on your mind ? "

"Something too preposterous—an idea I've been taking a good look at recently and not caring to believe in. I said just then I couldn't understand why the company won't install automatics and I mean that, but only fifty percent."

"If you mean," interrupted Costain, "that automatics would be useless on the surface, that operating the filters and loading the skaters and boosting them up demands control by men from base ship, I follow you. Which reminds me," he glanced at his watch. "We should be due for surface shift about now." He stood up and stretched.

Ralph rose, still looking worried. Then, as though blurting out the gory details of a murder he had committed, he said quickly: "I think the company have been holding off on automatics so they can bring in robots."

Costain remained in his stretching position, his hands above his head, his face turned in shocked surprise towards Ralph. Ralph's face coloured with the ease and brilliance of a fair person. Costain had deliberately to bring his arms down to his sides. Then he reached out and patted Ralph on the shoulder.

"Not on your life, sonny boy! Robots? Never! The Union wouldn't stand for it."

"What have the Union ever done for you, or me? It's not the Union and you know it! Robots would operate in that gunk down there like we would back on Earth. Sure they cost a fortune each; but they'd earn that in less than the decade it would take to reimburse fitting automatics."

"And you know darn well why Maurice wouldn't bring robots in."

Ralph laughed cynically. "Sure I know the ostensible reason! Robots can't be trusted. They're likely to go on the blink. They might run amuck and slaughter the entire base ship personnel. Sure, I know the reasons why robots are feared and hated by working men. And since when have those reasons ever stopped Maurice—or the other companies—from doing just as they damn well please?"

The red warning light went on. Costain cocked his head at it. "Five minutes to shift time. We'd better get along."

They went out of the cubby. Ralph dropped back for Costain to precede him. He said fiercely: "The company'll bring in robots and pay us off with a pittance, contract or no contract, and then we'll go to swell the unemployed masses

back on Earth, or any other of the planets we get our fare paid to. If they don't keep us sweeping up here."

"Sweeping up after the robots, Ralph? Swabbing up the oil droppings? Act your age!"

"If you can't see it I can't make you. But we don't have automatics, do we? And Maurice's son is spacing in next week, isn't he. Why?"

As they went through to ground control Costain began to wonder. By the time they'd seated themselves at the control boards and begun to feel their way into the machinery hidden down there beneath the poison belts and to take up the job of loading, filtering and blasting off, the picture had built up in his mind with frightening clarity.

Maybe, he decided, maybe he'd just pay up his back dues in the Union.

Once, a long time ago, Bill Costain had been a consulting interstellar engineer. A long time ago! Then a subcontractor had supplied faulty materials and a dome had imploded and many people—women and children—had been killed rather nastily. Costain had never got over that. Even though he had been completely innocent, he took the blame to himself with a fierce pride, a knowledge that he should have checked everything, including supplies from reputable firms twenty light-years from his construction shack. Since then he'd wandered the starways until, quite how he was never sure, he'd wound up bound by an inhuman contract, working for a pittance, skating ships down into Narberth's cloudy guts and filtering her seas and loading the refined rare metals and blasting them back into intersection orbits with the base ship on which he lived and had not left in seven years.

His story was common among the men who worked aboard base ship. Young Ralph had hit for the starways when he'd been old enough to comprehend the difference between an atomic rocket and a hyper-drive. Inevitably, it now seemed, he had been bound for Narberth, without the background or the training for any responsible jobs. He could control the machines that checked the flow of water, he could assist men like Costain who had the qualifications, he could obey their commands. And so he, too, lived on base ship above Narberth, the palace of Pwyll, Prince of Dyfed, who did favours for the Kings of Hades.

Robots.

Maurice King would never dream that he could get away with it. Robots were manufactured and sold at exorbitant prices and performed certain jobs under microscopic supervision. They could never be trusted to do jobs in competition with men and yet outside their jurisdiction. The Union—Mankind—could not afford to allow any infringements on their God-given powers. Automation, yes, fine. Use automatic equipment whenever possible ; throw problems at cybernetic agglomerations of clockwork ; depend on mechanisms to keep you alive in hostile environments ; use the machine as a symbol of advancing civilisation ; but never, never, never trust a robot.

Greenwich Mean Time was standard throughout the portion of the Galaxy penetrated by man, running in an easily accepted double-harness with the solar time of whatever planet you happened to be on. During the following GMT week, waiting for Barry King, Maurice's whelp, to arrive, Costain had much time to think about the problems of himself, the company, the lost skater and of robots. What he sensed rather than deduced worried him vaguely, made him uneasy, unsettled him without giving him anything upon which to base a fight back. He paid up his back dues in the Union. Not that the Interstellar Produce Operators and Truckers Union had ever done anything for the men beyond obtaining a ten-minute tea break midshift. Yet it was a tiny weapon, fragile ; but a bargaining point.

Jordan, another team boss, told Costain that he was a full year behind his quota. He did not mention robots.

The day Barry King arrived, Costain had been standing looking down on Narberth. Of late he had been drawn by the spectacle. The planet rounded, huge and swollen and swirling with the violence of upper atmosphere vapours, spinning away down—or up—there like the slowly closing lid on his tomb. It didn't do one's nerves good to stare too long at that enormous mass pendulous in the sky.

"The thing that always gets me, Ralph," Costain said, turning away with a little grimace. "Is the notion that eight hours a day I'm below all that poison, walking about down there, seeing what it's like, feeling its pressures, knowing it like a familiar country—and yet, there it really is, forever hidden from sight."

" You let yourself sink too far into your waldoes, Bill. When you shift your controls to operate a valve down there, it isn't *you* moving that valve, it's just an electronic extension, an inanimate lump of metal—"

" Inanimate ? Oh, come now, Ralph ! Those machines down there, with which we clothe ourselves, they're living, part of us. Look at old Grantley—he only comes alive when he's working on the surface. The rest of the time out of ground control he's a walking zombie."

" He's half crazy. He loves Narberth, what it looks like, what it feels like down there. Yes, I guess he is only alive one hundred per cent when he slips his control gloves on and starts work."

Costain said : " Grantley doesn't want to finish his quota. We all know that."

" But I want to finish mine ! I want to get off this hell-world and go back to Earth."

" But you're not on Narberth, Ralph. You're on base ship, out in space."

" Yeah. We all forget, now and then."

And then they went through to catch a glimpse of Barry King.

The younger King was completely unlike what Costain could remember of Maurice. Barry King had the broad shoulders, small head and powerful thighs of a man who would not be lost on a rugby field. His face was like an india-rubber ball, facile, easily twisted to suit the mood he wished to convey. Now it beamed geniality and his speech was liberally larded with ' old boys ' and ' old fellers.' Costain knew instinctively that under other circumstances he would like the man. Now, he couldn't be sure how he would react.

" Careful with those crates," Borden said peevishly. Loaders manhandled half a dozen new metal crates through into racks. They trundled into the lift and dropped into the bowels of base ship. Ralph looked at Costain. Costain kept his mind shut. Anything could be in those crates. Anything.

Borden was doing his usual suave job of impressing the boss's son. Costain felt sick, but let it pass. He had always felt sympathetic amusement for men who habitually act the part of hail-fellow-well-met, considering them not fully human and knowing that fact and suffering from it. The hearty type and nothing else elicited a wry amusement ; the

hearty type covering hidden motives of which the man was aware, was a different kettle of fish. Barry King was bright and breezy and beneath that was an unease stemming, Costain guessed, from friction with his old man. It remained to be seen what Barry's moves aboard base ship would be before judgement could be passed.

Costain took him on a tour of inspection down on Narberth. They seated themselves at ground control screens—a honeycomb of large, general view screens above the boards and the smaller, individual screens below. The controls were simple ; endless pairs of gloves sprouting from the plastic boards. Costain nodded to a filter control section and slipped his hands, after powdering to take up sweat, into a pair of gloves. He channelled in to a skimmer.

At once he felt that symbiosis grow and take possession of his mind. He was no longer aboard base ship out in space ; he was sitting in a flat-bottomed skimmer, riding the oceans of Narberth. He reached forward and took the controls. On the base ship his hands in the gloves moved, grasping empty air, fingered nothing with a gentle touch ; below, on Narberth, he felt the firm clean slick of steel and guided the skimmer out between the jetties. Under that supernal power of gravities, the waves moved oilily, suckingly, lifting the skimmer in an unhurried swell. Mists shrouded the distance and only the man-made filtering towers perched on their tiny crag of rock showed with any clarity.

These occasional islands, the tips of sunken mountain ranges, were valuable to mankind upon Narberth. Here his land-based technology could site installations to wrest the riches from the sea. The skimmer eased across the water, a metal moth plastered to a pool of ink, colour swirling from her screw in the water to the rear. The sky was its usual faded-sepia, like peeling paint. The loneliness, the desolation, the emptiness, came out and struck Costain like a cry from beyond the horizon rim.

" Some place," said Barry King. He was seeing the same things Costain was seeing, peering round from his scanner sited to the rear of the skimmer. The same things. Costain knew that Barry King would never see the things he himself would see on this unhappy world. " Is that the pumping station ? "

" Right. You can see all the set-up from out here. I'm not going out into deep water—we wouldn't easily get back and I've no wish to lose a skimmer so soon after a skater."

" No." King chuckled. " I guess you wouldn't, old man."

The tour lasted best part of four hours and by that time King had seen all he wished ; Costain felt the psychic snapping of rapport, almost traumatic in its intensity as he broke connection with the ground controls and returned his Narbert-enshrouded mind to base ship.

King sat back with a gusty explosion of breath and reached for a selfig from Costain's extended case. Borden came in, warned by one of his underlings, Costain guessed, and began to take over public relations with the boss's son.

" About that skater that was lost," Costain said levelly. " They used to say that any landing you walk away from is a good landing. Mr. Borden here walked away from that one quite safely." He stood up and went out the door.

The King Company's base ship was not really a ship in the strictest sense of the word at all. It was a vast conglomeration of living and working quarters, sprawling across space and interconnected by air-tubes and rocket-scooters. It was large enough to contain four berths for interstellar freighters which took back the rare metals. Costain has no specific knowledge of the number of men employed ; he hazily figured somewhere around the two thousand mark ; but if Barry King had brought in robots there would be labour troubles aloft on base, as well as by proxy down in the mists of Narberth's sea. The itchy feeling every man got when robots crept into the conversation would be translated to itchy fingers with crowbars if those robots showed up here.

Showing Barry King the sights had been extra-duty for Costain and now he made his way to skater control ready to supervise the hoisting of the latest filled skater from below. With the produce of the seas in her belly she would flame up into the atmosphere, drop her atomic rockets and then be gently coasted in on base. From then on handling crews would take over and stock the freighter on which King had come in. Just another day.

" Listen, Bill." Ralph met him just outside skater control and plucked his sleeve. " I had a word with some of the boys in stores. We—uh, that is—"

" What's in the crates, Ralph ?"

" Suits. Heavy duty, high-g suits."

" Interesting." Costain could not forbear to add : " Any robots, Ralph ?"

" No." The youngster had a stubborn look on his face. " But there will be one day, you see."

They went into control. " Who's going down, d'you think, Bill ? Barry King ?"

Costain laughed. " I know I'm not. Once is enough."

When he re-surfaced after shift, with little satisfaction in a job well done, his first thought echoed Ralph's query. Well, who was going down onto the surface of Narberth ? And, for that matter, why ? He went to his bunk and forgot his problem in sleep. Sleep was priceless.

So that when his buzzer summoned him he went along to the base manager's office in a foul temper, rubbing sleep from his eyes and yawning. Damn Borden ! A man had no rights, no privacy and now, it seemed, no sleep, either.

In the starkly functional office—Costain noted with amusement that the tri-di of the fan-dancer from Altair had been spirited away—the team bosses sat uneasily around, perched on the edges of their chairs. Borden lolled in a formfit. Barry King stood at a port, staring down on Narberth. Costain went in, nodded greetings, and sprawled out in his seat and shut his eyes.

" Now we are all here," Borden began and Costain sensed the knife edge of worry and hostility in the man's tones. " Mr. King has a few words to say to you. Please pay attention. That includes you, Costain !"

" I listen best when my eyes are shut. Fire away."

But Costain raised his lids to watch Barry King and to size the man up as he stepped away from the port and put his hands behind his back and began to speak. " I've come here to re-organise completely the set-up," he began without preamble. " This company is slack, inefficient and is way behind on production schedules. The other companies can promise and make good on delivery. We can't even promise any more."

Costain felt ashamed that he should get delight from this and the way it needled Borden. The manager was smouldering.

King went on : " I've discussed this with Mr. Borden. He says that some of you favour the installation of automatics.

From what I have seen of the surface of Narberth, automatics would be useless."

"That's right," Costain said lazily. "We never suggested that automatics could be used there. You have to have flexibility to handle wind gusts, variant weather conditions. Men will have to continue to control the surface handling. But the skaters—"

"I'm coming to that, Costain. We do not consider it wise to install automatics only on skaters and their allied equipment. When the King Company tools up for a job it tools up one hundred per cent. We intend to overhaul the whole organisation completely. In pursuance of that I'm calling for volunteers from you team bosses to go down to the surface in g-suits. I'll explain the rest to the volunteers."

He waited. No-one moved or spoke.

King tapped his lips with a square-nailed finger. "There's a thousand credits bonus in it, and—"

"I doubt if you'd get any of us to go down there if you paid us twenty thousand credits and tore up our contracts," Jordan said evenly.

"Yellow? Is that it?" demanded King.

Costain smiled. "That's right."

After that there was only one thing Barry King could do.

Costain was sleeping when King came up from the sea of Narberth. Ralph waited for him to awaken and then shook his head. His eyes held an unnatural light. "King looks beat up. His equipment was perfect; he's a rugged character; but he looks as though a skater fell on him."

"And that makes you happy?"

"Not yet. But Jimmy Gibeau has called a Union meeting after shift."

Gibeau was the Union steward. He was the sort of pale, wispy man who relished minor officialdom and yet had a surprisingly strong streak of idealism that made him fight tenaciously for what he considered his rights. The meeting indulged in much smoking, talking and gesticulation. It accomplished nothing. As Ralph said: "We can't do anything until the robots actually arrive. After that—"

"How do you know any robots are coming?" Costain was vaguely aware of anger; but had no energy to explore it.

Gibeau said : " We don't know for sure. But all the indications point that way. King went down to explore the possibilities for robots. Now he knows what type to order."

It added up. Costain left the meeting feeling upset. He didn't really believe that King would bring in robots. He thought they couldn't operate successfully away from the direct control of man ; and the hell down on Narberth was right outside man's direct supervision. The waldoes worked fine, even if they were a little slow. You might be able to tell robots what and where to go and do through radio. But that was the root idea of robots ; to let them think and work out their own problems, a sort of substitute humanity, with only a man there, in the background, but always on call just in case.

You'd have a technological tautology with waldoes and robots.

And, of course, you couldn't trust a robot.

Their brain pans were so finely balanced by the skills of man that they might come back to base and then, without so much as a single voltage-surge, sweep round and chew up the technicians waiting to serve them. Unpredictable. Likely to start pumping the machines the wrong way and spray back the rare metals into the sea. And all with that grave, unchanging metal brain casing that some joker had once called their face.

Young Ralph must have been spreading the word. He had worked up the men aboard base ship until you could sense the tensions in the air. Everyone seemed jumpy. Gibeau was his willing official tool. If a robot had showed its face then there would have been a wrench-crashing riot. King felt the currents, too. When he left he did so unobtrusively. Costain knew he would be back and, like everyone else, he feared that what Ralph said was right ; the boss's son would be back with robots. And no-one ever trusted a robot, even if it didn't put you out of a job. Even this job, bad as it was, represented security, bed and food. To be thrown out by a walking clockwork ape onto the human scrapheap was not at all to the liking of the men working above Narberth. Pwyll who crossed over into Hades, would have understood that feeling.

Some time later Costain was listening to a sensi-tape telling the story of how Pwyll, because he had claimed Arawn's stag,

agreed to take the King of Hades' shape and fight the enemy Havgan for him. "Take another shape and go to Hell," he said aloud. "I guess we do that every day." He sighed and went on to the familiar story of the inexplicable fashion in which no-one could catch Rhiannon, daughter of Heveydd the Ancient, until Pwyll called to her. A simple thing like calling out, and no-one thought of it until they'd ridden their horses into the ground. He shook his head, marvelling, and Ralph burst into his cubby.

Ralph was breathing so heavily he could not speak. His nostrils were pinched and white. He waved a hand before his face, weakly, and gulped. Costain switched off the sensitape, slowly stood up. He put a hand on Ralph's arm, and then they were both out of the cubby and running towards the airlocks.

The six robots stood straight and tall against the metal of the bulkhead. They were not switched on. The metal walls were more familiar than the metal men. A little crowd gathered and whispers spurted up as men pushed and jostled for a better view. The air had that thick sulphurous feeling you get before a volcanic eruption. The sort of thick, throat-grasping choking the men of Pompeii must have experienced before the cataclysm.

The robots, considered as pieces of machinery, were quite unremarkable. They were like no robots Costain had ever seen, on the screen or in technical journals. Their blocky bodies were supported by four legs, gnarledly jointed. They each had four whip-like arms and two bucket-grab general purpose arms in front. Their heads, with location, sensing and auditory and optical components had an austere beauty that in any other context would have given dignity to their monstrous bodies. The men's fear-smell stank in the ship.

"All right you men! Get back on shift!" Borden pushed through the crowd. He was as frightened as the rest.

Someone started to growl and his companion nudged him. Costain caught the mad-dog electricity-jumping you get before a riot. *And this one will be a beauty!*

Barry King emerged from the airlock. He looked down on the growing assembly. He smiled. He said: "I guess some of you wonder just what is going on. Well—we're carrying out a little experiment for the builders of these robots. They're new. So new that we've been given first crack at testing them." He raised a hand as a murmur

swelled. " And they are completely trustworthy ! All the old dangers have been built out. New types of conditioning, building the brain, ensure that they can never harm a human being. I assure you."

Costain knew he ought not to have felt surprise when the men accepted that, broke up, grumbling but sheepish. King had made it all sound so ordinary. And no-one had mentioned anything about losing jobs. But later on Ralph herded a group of workers into a corner and Costain saw him speaking in fiery terms, waving his arms. Borden strode past at that moment and the men broke it up. Borden button-holed Ralph.

Costain listened, cynically.

" Now, look here, Ralph. You heard Mr. King. If you go on working up the men like this, well, we'll have to think about you." Borden was still sweating. " I've let you run about shouting without doing anything about it. But you are the acknowledged ringleader. If you keep quiet, so will the boys."

" Why should I ? These metal monsters aren't safe. Anyone knows that—"

" These models are. Mr. King told you."

" And what about our jobs ? What will happen to us when they take over down there ?"

" Now don't let that worry you, son." Borden was sauve with his habitual caution. " No-one will be the loser."

Costain walked off. He had no time to waste over listening to the explosion when an unstoppable force met an immovable object. But the big question was still unanswered. Whichever side was right in this argument, some big, forceful and completely decisive new factor must enter the picture and tip the scales ; only that way would you ever resolve anything.

He was listening to the lavender and lace charm of the ancient Kenton's *Opus in Pastels* when Ralph came in and slumped moodily into the formfit. Costain tuned down soft and prepared to offer the comforting shoulder.

" I feel I'm right, Bill," Ralph said. His face was taut with inner conflicts and Costain had a warm, paternal sympathy for him. " Everyone knows you can't trust a robot. But Barry King has a smooth line ; I just saw him at Borden's suggestion—that man is scared out of his skin—and all the talk was of progress and new model robots and how everyone

is beginning to use them back home. And there'll be no danger to our jobs for a long time yet ; then we'll all be managers, according to King." His words were empty of meaning.

Costain hesitated. Then he remained silent.

Ralph went on : " But I'm not swallowing that old line of talk, Bill. Robots aren't human. They don't feel like we do. To them, that dump down there is just the same as an orchard in Kent in blossom time. They've no loyalties." He was working himself up again, back into his fiery mood. " King told me he was going down there tomorrow with the first batch. He asked me to go along. Said that I might qualify for robot liaison—my God—what a bribe ?" His shoulders shook gruesomely. " I warned him the boys might get out of hand and smash his robot pals."

" Did he take that as a threat ?"

" No. I don't like Barry King, Bill. But I'm sorry I don't."

" Which is as fine a compliment as you could pay him."

" Go down to that stinking poison outhouse of a planet !"

Costain studied young Ralph, liking and feeling sorry for what he saw. Pathetic, when a young man apes the cynicism and bitterness of his disillusioned elders. Disillusionment, when it comes, should come from personal experience and not from any feeling of belonging. Costain said slowly : " So I guess you are going down there tomorrow."

Ralph almost snarled it. " Of course ! What else could I do ? "

And Costain wondered if he had been mistaken about the cause of Ralph's disillusionment. Certainly, if Barry King could sway his fiery tongue, he should have little trouble with the rest of the men. He had a way with him, had the boss's son.

" But, Bill," said Ralph, rising. " No-one will convince me that a robot is worth tuppence. They're no good, the lot of them, new models or not." He slouched out.

Costain turned up the volume.

They were strapped into the skater the following morning when Costain came on duty. Two robots, activated, faintly humming, quiescent with promise of power and purpose and strength ; he looked at them once and then away.

Barry King had explicity asked for Costain to guide the skater in. It was a compliment. Costain had debated within himself whether or not to refuse ; then his innate sense of

fair play asserted itself. He was, quite without false pride or modesty, the best skater flier aboard. Therefore, with men—and their precious robots—aboard a skater, it was manifestly his job to take them down. Lesser hands could not be trusted. And this just after he had lost a skater.

He made a meticulous, methodical triple-check of everything. No-one could ever guarantee that a skater would make it safely down into the storms of Narberth. One of the troubles was the apparent quiescence of the surface : under that load of gravities, the sea never got up, never hurled itself senselessly against huge rocks. Only the long deepening surge sucking down and then mounting up with pile-driver force against the jetties spoke eloquently to those who knew of the primeval forces ceaselessly battling below. Hell—wrapped in a fur coat and looking like a million dollars.

Ralph came to see him before take-off, looking taut and braced and trembling slightly with anticipation. Then he and Barry King climbed into the foundation garments and had the gigantic and clumsy high-g suits bolted around them. Looking at them, Costain felt they looked more alien and monstrous than the robots themselves.

Derricks were used to seat them in the skater. The four gargantuan heads—the two steely beautiful robots and the two lumpily ugly humans—disappeared as the hatch slid shut. Costain walked quickly back to skater control from the air-locks, threw away his selfig and settled himself into the control seat which was joined by an umbilical cord of electronics and technology to the control seat aboard the skater. He got the all clear and let the skater drop free, pushed out of orbital speed by compressed-gas catapults.

The skater fell towards Narberth.

This time he brought her in to a perfect hop, skip and jump landing. Tugs chuffed out and towed her into the rocky crag and King and Ralph disembarked. Costain watched them from screens, moving from one to another as they passed the field of vision. He listened to their conversation, short, grunted—even with the mechanical marvels clothing them the pressure and power of Narberth demanded a man to exist on her surface.

" I wondered," King said inconsequentially, " when I first saw the planet why you called it hell. It looks really beautiful, that wide seascape and the high sky beneath the clouds. But

now I know. These pressures are, well"—he laughed—"they're frightening."

Ralph said: "Save your breath for walking."

On the screens before Costain the two shapes moved sluggishly forward, inspecting the drainage systems. Here a robot would be stationed and relieve two men operating waldoes. The monstrous shapes reminded Costain of misshapen fish, deep beneath the sea. The two robots glided forward with an ease and directness startling by contrast. When one spoke the voice was no more mechanical than the voices of the men; yet its shock to Costain was profound.

"This looks simple enough to operate. I can cope."

Jimmy Gibeau had come into the room behind Costain. He said nastily: "Sure, he can cope. But for how long? He's supposed to be a fascimile of man; so one day he'll be bored."

"Get out, Gibeau!" Borden said. "You've no right—"

"The boys want an observer, Mr. Borden. That's me."

The wrangle might have gone on longer but for the report that chattered from the printer. Costain took it and said: "Storm blowing up. Bad. We'd better get those men up here, fast." He relished the wasted effort to King.

"Hold it!" That was King, speaking from the surface. "Hold it! We can position this other robot inside fifteen minutes. Then we'll blast back."

"This storm is bad, Mr. King," Costain said. "And you intend to penetrate the dangerous sector over by the pumps. That's why the robot's going there. That whole—"

On the screens he watched, horrified. Slowly, and yet with a mounting speed that the wind and gravity thrust through the pressure, the pumping tower crumpled. It bent and bowed and a violent section of metal flange sprang out and struck King and pinned him flat on his back on the rock.

The robot turned and ran.

Ralph gave an obscene yell of terror. Then he was trying futilely to drag King out. King's mike was dead.

Gibeau echoed that yell of Ralph's. Something seemed to have snapped in his head. He ran through base ship screaming: "The robots have murdered King! Murdered King!"

"Stop him!" Costain yelled. It was hopeless. The riot which had been simmering, awaiting the final spark boiled over. The wrecking began. Borden wrung his hands and

cowered in skater control. Costain left him there and ran a perilous journey through into ground control. He flicked on screens, centred the pumping station and slipped on gloves without bothering to powder. His efforts to reach the trapped man were useless ; the waldoes either didn't function or were positioned too far away. From space, he could do nothing.

Outside, men were hacking the robots to bits.

" Can't—shift—him—" Ralph's straining gasps came clearly to Costain.

" Leave him, Ralph ! You can't do anything ! And the storm'll get you, too, if you don't hurry !"

" I can't leave a man down here—"

" No man can do anything for him now !"

The grotesque casing that enclosed Ralph's head swivelled; it looked exactly as an agonised man would look seeing a friend die. Metal—and emotion ? Nonsense ! " Come on, Ralph ! Get moving !"

Ralph gave a last, despairing lunge with his powered arms; the flange did not move a millimetre. Then he had turned away and began the struggle back to the skater readied to boost back. Costain could hear his choking sobs clearly.

" I believed in mankind—and I've failed him. Failed him. The robots started it all—" He went on. His broken voice paralled the havoc of destruction that raged through the ship. Costain sat, bowed ; grieving and hopeless.

Onto the screen, shot through now by the lurid glow and crackle of supernal lightning discharges, a shape moved on the edge of vision. Costain sat up, not believing. A robot. Moving carefully, bowed against the wind. Another. Two of them. Smoothly, they levered the flange, working in an inferno where any man, even encased in a high-g suit, would have been swept away, they uprooted the cruel metal, they dragged King clear. Then they vanished off the screen and when Costain picked them up again, almost lost in the gloom and confusion, they were closing the lock on the skater.

He broadcast the news over the ship's speakers. He told the crew. He hammered it home.

When King was brought in everyone thought he was dead.

Ralph was over his distraught phase now. White-faced, sweaty, red-eyed, he stood with the others, looking down on King's grey, painwracked face. King opened an eye. He

looked up at the ring of faces staring down on him like a frieze and tried to smile.

One robot, standing with the men, said : " We thought you were dead, Mr. King."

" Takes—more than—that—to kill—a man."

Slowly, not fully understanding what he was saying, Ralph said : " A robot saved a man it thought dead. Of what use was a dead man, eh, robot ? Why ?"

" Humans are afraid of robots. There is no need. We respect human life—"

" But you thought the man was dead," Costain put in.

" Yes. But we did what a human being would have done."

Ralph looked across at Jimmy Gibeau. A wrench fell from Gibeau's hand, clattered on the floor like a furtive tear.

" I guess—I guess—" Gibeau could not finish.

Costain was staring at the robot. It was the one which had run away. Obviously, it had gone to its counterpart for help. Things began to add up for Costain. Metal and machinery. Whatever magical tricks men did with them, they could not be inculcated with a human, fallible, unfathomable emotion.

Or could they ?

As the ring of men broke up, to go about the task of repair and clearing up after the riot, Costain took Ralph's arm.

" Looks as though the robots are here to stay, Ralph."

" Yes. Maybe I was wrong. Hell—I was wrong ! A robot, going back to what might have been its own destruction, to save a human being—*who it thought was dead* ! A live human—that I could understand. A robot would figure that a man was a useful tool, like itself, and when a tool is broken and there is no way to repair it—you can't bring a dead man back to life—why, the robot would toss it away."

" But it didn't."

Ralph walked slowly away, shaking his head. Costain looked purposefully for the robot. When Rhiannon went at different speeds, fast and slow, no-one had been able to catch her, no matter how fast they rode or ran. No. It wanted some other lever to get the answers here.

The robot was standing, quietly humming, alongside his fellow. The shattered hulks of the other four lay, sprawled and disfigured, along the bulkhead. Parts of their mechanical insides strewed the deck.

Costain, as a human, felt small and guilty.

Then, calmly, he said : " So you saved King's life."

The robot could not smile. Its voice could not change. It said: "We knew the situation aboard here. We knew what the man Ralph represented."

"Ah. So you had to impress him?"

"Yes. We know your position here, too. Mr. King, dead, was of no value to anyone. I thought he was dead. But I knew that if we saved him, it would appear a warm human emotion—and it cost us nothing. We are the new race of robots, Mr. Costain. We do not have emotions, but we use our brains." Little lights flickered behind the robot's grille. "You will, we know, not mention this."

"You know right," Costain said. He turned away, smiling wryly. These robots understood psychology all right. Their simple, un-robotlike action had taken away the basic fear of mankind—the job-fixing could be worked out later.

He shook his head and smiled, looking down on the golden brown bands of poison swathing Narberth, the planet named after Pwyll's palace.

"Never," he said softly, "never trust a robot."

*Kenneth Bulmer*

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# THE LONG ELLIPSE

*Astronautics will rely heavily upon astronomy and mathematics if Interplanetary orbits are to be accurate. If a ship misses its planetary target it will not necessarily plunge on into interstellar space—it will probably follow an elliptical orbit round our planets and eventually return to its point of departure some time later. 'Time' being the operative word.*

## By Donald Malcolm

---

General Hart, Commandant of Woomera Rocket Establishment, was in the act of snatching his first few minutes of real relaxation in a very busy day, when a Captain burst in with the news of the spaceship.

"Damn it!" he exploded, almost swallowing his cigar, "can't you knock?"

He favoured the chubby-faced relief aide with a glower from beneath his heavy, iron-grey eyebrows that had earned him the irreverent but affectionate nickname of "Eyebrows" Hart. He was never called this directly, not even by his closest friends.

His own aide, Colonel James, was ill. Being a man who could not tolerate illness, even in himself, his reaction was typical.

"You've no right to *be* ill, damn it, Paul," he had fumed. Gruffly, out of deference to an old and valued friend, he had added,

"But get well soon. I need you."

Not being good at that sort of thing, he had stalked away, bawling out people left, right and centre.

Now he was stuck with this young pip-squeak, who was spluttering an apology. General Hart's contempt for young officers with heads stuffed full of theory was nothing if not whole-hearted. They didn't make 'em the same, nowadays.

"Well, well?" he barked peremptorily, cutting off the Captain's rush of words.

Cringing a little before the baleful glare, the Captain explained shakily,

"Moonbase reported that an incoming ship had been picked up on the screens. She appears to be derelict."

The iron-grey eyebrows shot up in interest, as if they were rocket assisted.

"Derelict, you say?"

The General's stubby fingers drummed on his tidy desk.

"Has any orbit been computed for it, yet? Any identification?"

"Not yet, sir. The message was flashed straight through to here. The Central Electronic Computer in London is working on it."

Pushing the mangled corpse of his cigar to one side, General Hart dismissed the man, ordering,

"I'll be here; report any new developments immediately."

The officer saluted and left.

The Commandant hadn't too long to wait. A respectful knock at the door heralded the Captain, who looked as eager as a puppy on a leash.

"As far as Central can make out, sir, the orbit of the derelict touches the orbits of the Earth and of Venus. The—"

"Venus?" The General sat up and his face took on an expression of extreme attentiveness.

"Yes, sir. The ship has been identified by a lunar monitor rocket. She is the *Ulysses* and—"

The officer paused in consternation as he looked at Hart.

The General had blanched as white as a sheet and his hands gripped the chair arms until the knuckles showed through.

"*Ulysses*," he whispered, his voice a croak. He seemed to have difficulty in speaking.

"Are you all right, sir?" the Captain asked, concerned, placing a cup of water on the desk.

Hart gulped the water down in one draught, then gasped, touchily,

"Yes! Yes! I'm all right."

But his attitude belied his vehement denial.

His shoulders slumped and he stared at the polished surface of his desk.

"You see, sir," the aide went on, watching the General keenly, "the *Ulysses* was the fourth ship to try and reach Venus. She disappeared and she was written off as lost in space. It was unknown whether she had crashed on Venus or gone into the Sun."

He hesitated again, unsure whether his superior had heard him or not.

"Sir . . . ?"

The General moved a limp hand in acknowledgement, but continued to stare fixedly.

The young man licked his lips and continued nervously,

"It looks to me as if the ship must have missed Venus completely, perhaps due to lack of fuel or faulty navigation. *Ulysses* continued to coast along her ellipse till she arrived back at the orbit of the Earth."

Conscious that he sounded like one of the Space Academy lecturers, he plunged on with the explanation, anxious to get it over with as soon as possible.

"Naturally, the Earth wasn't there, having moved along its orbit. The ship has made six circuits, taking five years. She'll pass within approximately one thousand miles of Smith-Ross One in"—he consulted a sheet—"nine hours time. These figures are subject to alteration, of course, sir."

Rising, the General turned to the window and stared out at the sun-blasted Woomera desert.

After a lengthy silence during which the uncomfortable aide fidgeted furtively, General Hart ordered without looking round,

"Captain, go over to the green filing cabinet, take out the *Ulysses* file and read me the names of the crew."

With a puzzled frown, the aide complied. The General still had his back turned.

He began,

"Captain Means—"

"Just the names."

The aide cleared his throat and went on,

"Penny and—"

He stared at the last name.

" And ? "

The other swallowed hard a number of times, stared at the General's back, then at the paper.

" Hart," he managed to finish feebly.

The senior officer swivelled round, his hands clasped tightly behind his back, his face rigidly controlled. A tell-tale muscle ticked high on his left cheek.

" Hart. Yes. My son."

The Captain opened his mouth to say something, but thought better of it. What could one say that would escape being banal ?

He waited.

" That's his coffin up there," General Hart continued, as if the aide wasn't present, " and I'm powerless while it careers on past into space again."

He's going morbid on me, the Captain thought uneasily.

Hart stopped pacing and sat down abruptly. In the space of a few minutes, he had become an old man and the Captain was embarrassed by what he saw. It was no longer the barking, fiery, peremptory officer, commanding respect, getting it, who sat before him ; only an empty shell was left, as if every emotion save grief had been drained out.

" The shock killed his mother when the news of the ship's disappearance came through," the General said quietly. " I —I don't think it's going to do me much good either. I wish the ship had never returned."

The Captain fervently wished himself anywhere but in this room. The Space Academy didn't equip you to meet this sort of situation. It wasn't pleasant to see a man crumble ; especially Hart. He was a legend at the Academy. The first man to tread the surface of the Moon.

He was saved the necessity of a reply as the harsh buzz of the desk communicator invaded the room. Hart flicked the toggle savagely, barked,

" General Hart."

" A call from the Space Co-ordinator is coming through, sir," a well modulated voice informed him.

" Thank you."

When he dismissed the Captain, he seemed to have regained his composure. The officer felt gratified that the General had paid him the compliment of taking his silence for granted. At the back of his mind, he knew his career would be so much

space dust if he ever breathed a word. The aide departed gladly.

While Hart waited for the call to come through, he thought about a jumble of things ; space, his son, Ted, his own heart trouble that kept him tied to a fretful desk.

Space travel had always been in the hands of the military ; only they had the necessary experimental and testing facilities and immense sums of money required. Private industry had its share, naturally, but the military held the whip hand.

Contrary to opinion in 1957, neither America nor Russia had been the first to establish a manned satellite in space.

France's decision to increase tariffs on imports led to the swift disintegration of a European Free Trade Area in its infancy. The exclusion of British agriculture and textile industries also helped. The United Kingdom had strengthened its ties with the Commonwealth.

Among other things, research into all aspects of space travel had forged ahead, and, in 1971, the first Smith-Ross manned space station was in orbit. In 1974, Hart reached the Moon and man had set his foot on the long road to the planets.

Six years later, Mars was finally contacted. In 1982, the fourth ship, *Ulysses*, left Smith-Ross One for Venus, with Hart's son in the crew.

The ship had not returned. Until now.

The buzzer harshly interrupted his reverie.

He cut in Circuit 4 and top security scramble. Boste's deeply lined, aristocratic face filled the screen and his deep, resonant voice greeted Hart.

" You've heard the news, of course, John ? Well, the Council for Space Co-ordination has decided that an attempt should be made to retrieve the records from *Ulysses*."

Hart's keen gaze detected the other's unusually hesitant manner, even as he himself started at the Spaee-Co-ordinator's message.

" Nothing . . . more, Harold ?" he enquired, his mind a turmoil behind his composed face.

" I—uh—no. That is, I thought you ought to know about our plan."

Damn it, Boste even refused to meet his eyes ! There was something fishy going on General Hart decided quickly, and

he was going to find out what it was. The records would certainly be worth retrieving, but General Hart's incisive military mind told him that there was much more to it than that. But what?

Calmly, he reproved Boste in a chiding manner.

"Well, I should think so. After all, I *am* in charge here."

"Er, yes. A full report will be sent to you. 'Bye, John."

As the image faded from the screen, Hart thoughtfully lit a cigar, and contemplated the glowing tip through narrowed eyes.

He analysed Boste and his queer behaviour. For a life-long friend, he had been extremely callous. No mention, no sympathy for Ted. Boste's had been the shoulder he had leaned on when he brooded too much about the boy and his mother.

General Hart remained motionless for perhaps five minutes then made his decision, fully aware of the consequences it might have on his health and on his career. A ship was scheduled to leave for Clarke's Corner soon.

He meant to be on it.

Doctor Keilly, the Base's plump, little Australian M.O., glanced up as General Hart entered, closing the door carefully behind him. The office was in its usual state of organised chaos.

"Mornin', John," he said, pushing a chair across. His casual manner was excellent cover for a razor sharp brain. Anyway, Australians don't hold with 'sirs' and such pomp.

Producing an apple from somewhere under a pile of papers, he settled back in his own seat, and waited for the General to speak. Hart wondered idly if he had an orchard in the back room. If Keilly reincarnated, it would definitely be as a plump, rosy Jonathan.

"Tim," he came to the point bluntly, lighting a cigar, "I'm taking a trip to the main space station"—his gesture stopped Keilly from speaking—"and I want you to give me some hocus-pocus that will help me to withstand the acceleration."

Keilly took a noisy bite out of the apple.

"Why?" he asked succintly, chewing energetically.

General Hart explained briefly, trying to shut out the annoying *crunch-crunch*, and finished,

"I feel there's something fishy going on and I want to get to the bottom of it."

The little doctor dexterously flicked a piece of apple off his upper lip with a pink tongue.

"You know the danger you're puttin' yourself into, don't you? As your doctor, I'd advise you to forget it. There's probably nothin' to be suspicious about."

The other ignored this masterly and airy dismissal.

"Will you or won't you give me a jag?" Hart demanded shortly, rising.

Seeing that the General's mind was made up, Keilly shrugged and stated,

"Very well. But this could mean both our hides. And I've grown attached to this place."

He waved his hand vaguely around the untidy office.

"If you'd prefer it, I will order you," Hart retorted coldly, determined to let no one stand in his way.

"Don't take it that way," Keilly replied amiably, refusing to be ruffled. "I'm only tryin' to help, you know."

Knowing that the officer was no good at apologising, he ordered crisply,

"Roll up your sleeve."

He indicated a pad of cotton wool and a bottle.

"Clean your arm with that while I prepare a needle."

As he busied himself, he said over his shoulder, "Sit down, John."

"Why?" General Hart's voice was suspicious.

Turning, the Australian held the needle up to the light.

"Simple. You can't just up and run. Take a seat."

He pressed the plunger home.

After sitting a few impatient minutes, the Commandant rose and went to the door. Pausing with his hand on the handle, he turned.

"Not a word about this to anyone, Tim. That *is* an order. I've covered myself."

He smiled disarmingly, but the M.O. detected the steel in the other's voice. He nodded.

"I'll see you when I come back."

Staring at the closed door, Keilly wondered sombrely if he *would* be back.

Absently, he switched on his wireless and listened to two eminent F.R.S.'s from Scotland discussing their famous Mirror Theorum.

Clarke's Corner was busy. Five acicular ferry rockets and two dumpy Moon ships lay at various angles like some cosmic painter's silver afterthoughts on the magnificent canvas of space. As he transferred to a spacetaxi, General Hart tried to hide his elation at being back in space. Damn it, creaky ticker or not, this was worth it. Space seemed to envelope him with tendrils of comfort and the unwinking, colourful stars extended long travelled beams of welcome to an old friend.

Wile the taxi rocketed the two-odd miles back to the space-station, he watched a bustle of activity near one of the ferry rockets. Something of the chill of space seeped into him when he thought about the men continually risking their lives, like spiders at the end of tenuous web-strands for life-lines.

The spacetaxi buzzed like a mechanical bee into the heart of the great silver sunflower of the spacestation.

Once aboard, Hart floated his way towards Commander Trellan's office. Although his surprise was obvious—Hart had neglected to warn him—he welcomed the General courteously and waited for him to explain his presence on Smith-Ross One. He was aware of Hart's cardiac ailment and he knew that the reason would be a good one.

Hart knew Trellan for an efficient, close-mouthed officer and he took him into confidence. The station Commander admitted that things did look a bit odd in view of what the General told him. In the Observation Room in the Hub, which was at rest with respect to the spinning station, Trellan had a crewman set up a small telescope to the position where the attempt would be made to meet the derelict.

"What's the activity over at Clarke's Corner?" Hart enquired.

"I believe they're fitting extra rockets onto a spacetaxi, sir. It will be more suitable for the manoeuvre, a very tricky one."

The famous eyebrows hoisted themselves in weightless interest. A buzzer sounded and, flicking a toggle, Trellan identified himself.

"Observatory, sir. The derelict has been sighted."

Hart thumped a decisive fist into his palm.

"I'm going over!" he announced, loosening the straps of his chair.

"But sir . . ."

"No buts ! This is the only way to find out what Boste is *really* up to. Records, bah !"

The crewman, who had been adjusting a small finder telescope using the orbital co-ordinates from the Observatory, said, "She's in the field. now, sir."

The *Ulysses* was little more than a point of light, but Hart could discern that she was travelling broadside on to her direction of motion, like a drunken whale pulled by the inexorable harpoon of gravity.

He straightened from the eyepiece. He wás riding high on the crest of a wave of excitement. Soon he would know. Soon.

When General Hart arrived, the men at the Corner couldn't have been more surprised if the Sun had suddenly winked at them.

The spacetaxi was in the cargo hold of the ferry rocket and a tall, hard-looking Major from Space Co-ordination (Engineers) was directing the bolting of the last tube, in brisk, arrogant tones.

"Hello, Major," General Hart remarked conversationally "nearly finished ?"

Let it be said that the officer managed to control his surprise well.

"Why . . . General Hart ?" His voice rose on a note of query.

The men were about to stop work, but Hart waved them on.

"May I ask why you are here, sir ?"

The Major's thin face wore the beginnings of a worried frown.

"You may. I'm going over to the derelict."

The Major did a double take, recovered himself, and countered with,

"I have not been informed of this, General. My orders are specific. I'm afraid I cannot allow you to go, sir."

"Oh ?" Hart queried ominously.

Knowing it was bad to argue with another officer in front of other ranks, he beckoned the Major away from the work.

"I'm going, Major. *Ulysses* is my son's ship. Don't try to prevent me."

The other stood firm, his cheeks two burning patches.

"My orders are direct from Co-ordinator Boste himself. I will take no responsibility for the possible consequences of your action, sir."

General Hart poked him in the chest, which, if the Major had only known it, indicated that the Commandant liked his spirit.

" Let me worry about that, son."

He made a mental note to recommend the young officer.

Going back to the work, he grunted to the Engineer Sergeant, " Will you be much longer with that tube, Sergeant ?"

The N.C.O., who had never been within a mile of a real live General before, glanced nervously at the Major in the background.

" Not long now, sir."

" Carry on."

The General inspected the rest of the work while they finished off. The craft was already fuelled. A spacesuited figure entered the cargo lock just as the job was finished. He clambered into the taxi, while the rest of the men, except two who were pulling on suits, left the lock.

" What's happening, now ?"

" The pilot is going to test the taxi outside, sir. These two will shove it out of the lock."

The Major sounded decidedly surly.

The General nodded, ignoring the other's attitude.

This task was soon completed satisfactorily, and the ferry rocket left Clarke's Corner. She would take the spacetaxi into the vicinity of the derelict, where the small craft would take over and attempt to complete the tricky manoeuvre of matching velocities with the *Ulysses*.

The pilot of the ferry was receiving minute-by-minute corrections on both ships' courses and velocities from C.E.C. in London, via the station. From this data, he could control the rocket bursts he would need.

General Hart was too excited—although he maintained an outward calm—to pay much attention to the preliminary manoeuvres to match velocities. Using a small telescope, he watched the spacetaxi speed across the intervening space between the ferry and the derelict. His heart was thumping a bit more than usual but he put it down to his excitement and ignored it.

He was about to turn away from the eyepiece, when something caught his eye. He stared hard, closed his eyes tight, then opened them again. His mouth was suddenly dry. It was still there.

A light from *Ulysses.*

*Winking.*

He licked his lips. His heart seemed as if it would burst out of his chest.

The light could mean only one thing.

*Someone was alive* !

Could all three members of the crew be alive, he wondered. Each man had been provided with enough food and water to last him two years. That covered the 145 day journey to Venus, a stay of 464 days on the planet and the return to Earth, another 145 days.

They couldn't all be alive then. They have been away five years. But there would be sufficient provision for *one* man.

What about the other two? Beyond the turmoil of his thoughts, a part of his mind inexorably computed the possibilities. If they died near Venus, the survivor had sufficient food. If they had died later, there would have been no survivor, unless . . .

He shuddered.

Eagerly, he grasped at another possibility.

Perhaps they landed on Venus and found food. Yes ! That was it. No murder, No cannibalism. He breathed easier and watched the manoeuvre.

What about the relative positions of Earth and Venus? another voice contradicted insidiously. You can't simply blast off any time, you know. Venus and Earth must be in the right positions.

And he had to face it. Venus, at present an evening star, could not have been at the point of departure of the *Ulysses* from the Venusian orbit.

He felt as if his head was being used for a battleground. Sweat beaded his brow in damp clusters. He couldn't escape the conclusion.

Only one man was alive.

The light was still winking.

His fists clenched into tight balls.

Did he want the boy back if he was a murderer, or maybe worse? Nothing would be changed, except that honour would become disgrace. The boy had been lost to him anyway. Oh, God, why did the ship have to come back? Why?

He was having difficulty in thinking straight. Ted might not be alive. Sharp claws of pain tore at his chest.

He coughed twice, rackingly.

The derelict's airlock door began to open.

He slid away from the telescope into a bottomless blackness.

His head felt full of mashed potatoes when he came to. At first, he didn't recognise where he was, then his surroundings became familiar ; the hospital satellite, five hundred miles above the Earth. The strategically placed restraining straps told him that he was in a weightless room at the Hub. From the way he felt, he surmised he was under the influence of sedatives.

He became aware of someone sitting beside the bed. He forced himself to look.

" *Ted* ! "

The name was torn from his lips. All his previous thoughts flooded back.

His son smiled.

General Hart didn't try to rise.

" How ?" he asked weakly.

He had to know, even the worst.

" Let Co-ordinator Boste explain, Dad," Ted replied.

Boste and Keilly were at the back of the room.

Looking slightly ruffled, Boste shook his aristocratic head despairingly and observed,

" There's no fool like an old fool, eh, John ?"

General Hart flushed.

" You remember," Boste continued, " we retained radio contact with the *Ulysses* until she was within half a million miles of Venus ? The 400-inch at the Space Observatory was following the ship's position by means of the beacon flares released periodically from it.

" The ship ran bang into one of the many uncharted meteor streams in space and the last radio message was abruptly sliced off as Penny was reporting hits."

" So much for the astronomical odds against being hit *once*," Keilly commented.

Boste nodded, a trifle impatiently, and went on.

" A tremendous flash was observed some three and a half minutes after radio transmission ceased. We heard nothing more and we had to assume that the fuel tanks had exploded, destroying the ship.

" In fact, damage was extensive. The antenna was carried away. The automatic beacon flares popped like a fireworks

display and the explosion of the fuel sent the ship off course. That's one of the reasons she took five years to come back instead of four, as we expected."

He paused and adjusted the control of his grav-chair.

"The Space Board was worried about the high percentage of losses incurred in our attempts to reach Mars and Venus. About six years ago, the scientists discovered the secret of suspended animation. They managed to produce a serum that could induce it.

"After the third ship had failed to make Venus, someone suggested that the SA Serum might help in certain circumstances. One of these allowed for the ship missing Venus completely and orbiting the Sun for four years before meeting up with the Earth. Of course, it turned out to be five years."

He smoothed his greying temple hair back.

"When *Ulysses* was damaged, Operation Deep Freeze went into action. Means, the Captain, immediately injected the others with the serum, while he took watch. (They were psychologically treated to withstand loneliness, anyway). In that way, they took turn about and conserved food, water and air. The winking light was prearranged."

Earnestly, Boste concluded,

"These men have travelled the long ellipse and survived to give us the key to the stars."

A nurse poked her head round the door.

"That's enough, please, gentlemen. He's not to be excited you know."

Their laughter must have rocked the station.

*Donald Malcolm*

*During his short but meteoric rise as an outstanding new science fiction author Brian Aldiss has managed to break most of the editorial taboos with which science fiction editors hedge their requirements. He does it again in the following story—this time it is modern war and religion—yet the approach is so smoothly and expertly done that, as usual, he can get away with it.*

# THE PIT MY PARISH

## By Brian W. Aldiss

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A small truck turned smartly off the road and ran into the steps of the Royal Albert Hall with a rousing crash. Three small boys legged it out of the cab on one side as Army types ran up on the other.

"Run like badgery!" Chip the Slipper called, showing them how.

It was six o'clock on an early winter's evening, with darkness and blackout coming on. The three boys pelted through the smudgy greyness round the other side of the building, which had been commandeered for the duration of the war to serve as an all-services' canteen.

They had timed their smash-up well: the five ton supply lorry which they had been tailing from Southall was just standing in front of the store door while the driver talked to the storeman.

Chip ran without hesitation up to the two men as his friends, Taggy and Sponge, ducked out of sight and crept towards the lorry on the blind side.

"Round the front, quick!" Chip called to the men. "Didn't you hear it? Come on! Fire! Fire!"

He ran on, not pausing, waving to them to follow. The driver and the storeman looked at each other and took a few doubtful paces forward. As they did so, the lorry door slammed behind them, its engine burst into life, and it began to move off.

"Hey!" the driver yelled. Food supplies were so short in the country, he could be court-martialled and shot if he let that lot go. Running like fury, he flung himself against the back of the lorry. But there was no foothood for him, and as the vehicle gathered speed he fell to the ground.

"It's the delinks!" he shouted to the storeman. "Grab that other little b——"

But Chip, the other little b—, was not easily grabbable. At thirteen he was an old hand at this game. He faded like a ghost from the vicinity and was back with the rest of the gang within an hour.

Sponge and Taggy, meanwhile, sat grimly crushed together in the driver's seat of the five-tonner, heading round Kensington Gardens, which had now entirely vanished behind gigantic walls, turning the park into a fortress. They drove fast with an appalling mixture of precocious skill and ignorance of death, weaving among the pedshaws and other vehicles. These pedshaws, virtually rickshaws attached to pedal bikes, were an idea imported from the East, forced on the West by stringent petrol-rationing; they swamped London, transforming the nature of its traffic problems. Also moving along like small battleships were the atomic cars which had only appeared since the beginning of the war, top hats or top brass visible through their narrow windows. The two boys skirted them recklessly and turned into the Bayswater Road.

So they came to the Pit.

Where the regular road had been replaced by Bailey bridging over broken ground, Sponge flung the steering wheel over and they careered across stubble, bouncing among bushes towards a ragged wall. Here a whole vast perimeter had been wired off by thick entanglements of barbed wire—except at one point where the coils were crushed down and bridged by a dozen thicknesses of linoleum, crudely flung on top of the barbs. Heading smartly for this sudden outburst of patterned red and blue, the lorry bucked over it, thundering into the Pit.

" It's in the bag !" Sponge sneered, letting Taggy take over the wheel entirely as he lit himself a pipe of shag. As a fourteen year old, he regarded cigarettes as kid's stuff. He held a lighted match over the bowl, noting triumphantly that it did not shake. Sponge was tough.

The Pit stretched West from the Edgware Road almost to Queensway. It was one of the first new landmarks of the third World War, now dragging into its fourth year. The ruins of Paddington station lay within its deep and jagged embrace.

It was by no means just a very large crater. The close-patterned high explosives which had caused it had created a veritable new landscape, intricate and indefinable. There were crazy hills here, some of which concealed whole blocks of flats ; there were valleys, with waterways formed in old underground railways. There were acres of barrenness without two bricks on top of each other ; and there were rows of buildings which still stood, though they let in rain and moonlight. The whole was peppered and pocked by stunted greenery, or waste paper which blew endlessly round the Pit as if in search of escape.

The Pit had its own population. The delinks, young delinquents in revolt against the world, congregated here from all over London. This was their hole, their hell, their home.

Now it was almost dark. The plundered lorry slowed to walking pace, bumping over debris until it came to a garage with splintered doors. It rolled in, and Taggy switched off the ignition. The two boys jumped out, cold now the excitement was over.

" Nobody didn't even attempt to follow us," Taggy said.

" Course not," Sponge said. " Even if the cops know we came in here, they wouldn't follow. They know the sort of welcome they'd get in the Pit. Until they get enough men to mop this place up proper—and that won't be till after the war—we're safe as anything. You aren't scared are you, Taggers boy ?"

" Scared ? *Me* ?" Taggy said, and laughed shortly.

They dived into a pile of rubble, pushing through two concealed doors covered in sacking and so came into a subterranean tunnel, its roof crudely shored up with timber.

" Sponge and Taggy," Sponge announced to the child at the far end of the tunnel who crouched, concealed in a haze of cigarette smoke, behind a sub-machine gun. He ordered them forward. They passed him and went through another door.

This was the club room. Of all the many and often warring gangs in the Pit, the Ed Gang, to which Sponge and Taggy belonged, was the biggest and best organised. Ten stolen tele sets flickered here, bold beat music sounded, a bar dispensed a variety of drinks. Women were here, dancing and laughing or kissing in corners—hard women of ten and eleven with made-up pans and crumpled nylon underwear. Their bright clothes contrasted with the blacks and khakis worn universally by the male delinks. Their little voices were as ugly sharp as old razor blades.

One of the women, Ilford Lil, called out to Sponge.

"I'll be back, honey," he called, not pausing. "I gotta report in to Ed or he'll shoot me. See you."

He had not smiled at Ilford Lil. His face never wore an expression. He was even learning to speak without moving his mouth. He had in his mind a little picture like a cold point of fire of what he was going to do with Ilford Lil when he had seen Ed ; Sponge also made love with as little expression as possible.

Hunching up his shoulders, he pushed a way for himself and Taggy over to a far door, struck it grudgingly with his knuckles, and barged in. The door swung to behind him ; carved deep onto it was the single syllable ED and, beneath the syllable, the sign of the cross.

The pocket corvette *Sherbourne Drive* lay silent, moored to the lee of Westminster Bridge. When the drunk strolled up to it, humming to himself and threw a bottle top onto its deck, the noise was startingly loud. The sentry rose from his seat in the bows and said, "Hey, you, clear off ! How did you get in there ? Don't you know this is a restricted area ?"

"Never heard of 'em," said the drunk with conviction, although five minutes earlier he had scaled a twenty foot wall with hook and rope. He moved on down the river's edge. During the brief exchange of words, when from the waterline his body was silhouetted against the dark sky, the sentry had received a heavy, Chinese-type throwing knife in his back.

As he collapsed onto the deck, three small figures hauled themselves dripping aboard the corvette. The drunk, still busily acting his part, moved further up the embankment and was lost to human ken until he reported back to gang H.Q. two hours later.

"Nice throwing, Chuck," Tom Toolbag whispered.

Chuck the Chucker nodded without speaking as he retrieved his knife from the sentry's body. He was a handsome boy of fifteen and a half who had left home to avoid the universal call-up which would otherwise have taken him to the Ural battlefields six months ago. Now he stooped, tried on the naval peaked cap, and dropped it over board disgustedly when it proved too big for him.

Bent double, the three of them crept to the narrow companionway, plunging down it in a bunch, ready for trouble. But the week's watch they had previously kept on the corvette had not been for nothing ; the ship, as they had suspected, was empty apart from the dead sentry.

With the blackout door in place behind them, Chuck switched on a torch and found the lights. Tom and Frogseyes who was nine, looked at each other in evident relief and lit up reefers, puffing deeply.

" Never mind smoking," Chuck said, pulling out a large sheet of paper, unfolding it and spreading it on a table. " Here's the list and pictures of all the instruments Ed wants us to collect. Get your blowers out and get cracking. We've got . . . just over a hundred minutes before Barney comes by to pick us up. And if we ain't ready, Barney won't wait."

They broke up, each producing oxy-acetylene cutters and goggles. Working amateurishly but keenly, they began to demolish various items about the little ship, detectors, indicators, compass, a Hevison heater, signal equipment, even a fuelling pump. As the equipment piled up at the foot of the companionway, the immaculate under-deck order was replaced by chaos.

Finally, they turned off all illumination bar Chuck's torch and formed a human chain to move all equipment topside. Their timing was good. They had the loot stacked on deck and were taking a breather of damp night air when a subdued toot sounded alongside.

" That's my lovely boy !" Chuck exclaimed. " Good old Barney. He'd slit your throat but he'd never let you down."

The shape of a motor boat riding without lights could just be discerned against the oily glimmer of the water. It bumped into the *Sherbourne Drive* and a line snaked up to them. Frogseyes heard it strike, ran and got his foot on it ; Chuck secured it to the rail.

" Let's have the kitty, kids," Barney called to them in a husky whisper. " Sharp's the word. River's swarming with ruddy patrol boats."

They lowered the stuff bit by bit over the side to him. He placed it methodically on sacking at his feet. When they had cleared the deck, the three of them slid over and jumped into the motor boat.

" Sogging good timing," Chuck said. " Ten minutes before the new sentry comes aboard and discovers the dead 'un. Get her weaving, Barney."

" Hold tight," Barney commanded, casting off. With a surge of power, they began to rock up-river. A small police boat, which had lain unobserved in the shadow of the corvette, launched itself sturdily in pursuit of them.

They flicked under two bridges and spun, under Barney's show-off expertise, up a muddy side creek, where Barney moored and swarmed up a vertical ladder in the quayside. A crate, lowered on block and tackle, loomed out of the night and settled onto the deck of the motor boat. When the stolen equipment had been piled into it, Chuck the Chucker and his two underlings climbed up the ladder. In a few minutes, the crate was up on the dock and loaded into a waiting convertible.

The four of them huddled together in the blackness. Barney was a big fourteenager who stunk proudly like an animal.

" We got to wait till we get a flash from the dock gates," he said. " Lot of ruddy flat feet about tonight."

This was one of the very few stretches of the London Thames still remaining in private hands. Most of it had been nationalised under pressure of war and harboured some secret waterborne enterprise. In this strange global conflict where, after four years of war, both sides still hesitated to launch the first hydrogen bombs for fear of immediate reprisals, the sea had grown into more of a battlefield than anyone could have visualised a decade before.

As they waited, another figure climbed from the riverline and, under cover of darkness, stowed himself efficiently on the luggage rack on the convertible roof.

" Shut up stamping your feet, Frogseyes," Chuck commanded. " I thought I heard something."

" I'm cold," the young delink complained.

" You're scared, you mean. This is the last job you come out on, my boy. From now on it's guarding the perimeter of the Pit for you."

"Okay, stow the gab, Chuck," Barney said. "There's the blinker. Get aboard jildy."

They piled in on top of each other. Barney started her up and they purred towards the gates, one of which swung open to let them through. Barney waved to a vaguely glimpsed face and then they were swinging out among a dark line of traffic. Twenty-five minutes later, they bumped into the Pit. Barney edged the vehicle into the shelter of what had once been a cinema and climbed out.

"Tom, you and Frogseyes can mizzle now," Chuck said authoritatively. "Me and Barney's going to report to Ed that the mission's completed. Go on, scarper."

The two young delinks began to argue. Barney cut them short.

"Like the gentleman said, badger off," he ordered. They faded without another word ; Barney's temper was something one did not care to disturb. The two seniors, not speaking to each other again, headed for the club room. Chuck slicked his hair back with a comb as he went. By the time the detective had climbed off the roof of the convertible and faded into the shadows, Barney and Chuck were pushing through the door with the sign of the cross on it.

The missions to which Sponge, Chuck the Chucker and Barney had been assigned were mere strolls in a garden compared with the job Tubby Turner had been landed with. He had been one of Ed's most faithful disciples, and one of the first. On Ed's prompting, he was one of the few delinks not to evade the call-up. A young man of eighteen, Tubby had now been in Satellite Service for three years, and wore two blazes on each shoulder. Nobody knew of the other outfit he secretly served.

He stood now, sweat beading his upper lip, in an underground station in Peary Land, North Greenland. This refinery produced, from local minerals, many of the chemicals needed for the handful of men who, in austerity and discomfort, peered down on the warring globe from distances of three hundred to a thousand miles away—the chemicals needed to sustain life in those flimsy metal bubbles, the chemicals to lift the men up there and down again.

Man had reached space. The satellites Russia had first placed in the sky in 1957 had been superceded by others capable of carrying men. But the men crouched with their

eyes turned—not outwards to the moon, the planets, the stars —but down to the battered cities and the enemy positions.

" You can nip off if you like now, Bert," Tubby said to his underling. He sat in the seat of a fuelling tractor now being filled from a wall cock labelled ' $H_2O_2$' in red.

" Well, if you don't want me . . . thanks a lot," Bert said. He headed off down the corridor towards the living quarters, already fishing in his pocket for the inevitable pack of cigarettes. Tubby Turner waited till he had gone, then slipped from the tractor.

Dodging under the thick pipe which carried the hydrogen peroxide from the great reserve tank, Tubby unlatched a small inspection cover from the wall. Inside, the pumping equipment gleamed. Tubby hoisted his little time bomb from the tractor and set it down carefully beside the pumps. He activated it, glancing at his wrist watch. It was 0414 hours. He had twenty minutes before the place went up.

Putting the cover back in place, he glanced at the tractor gauges; the mobile fueller was now over three-quarters full. Tubby broke the cocks and disconnected the feed, not stopping to watch the piping snap back into the wall. Travelling at the regulation 10 miles per hour, he moved down the corridor and rounded the corner in the direction of the vehicle exit. The sentry at the double doors nodded to Tubby and swung them back on their hinges. The tractor forged ahead up a long sloping tunnel. Snorting, it emerged above ground and pulled onto the level.

It was a fine, still night, thirty below, the stars gliding overhead like wolf eyes. Infra-red kept the great landing field clear of ice, mock-window rendered it undetectable from the air. Three planes of the Moonwatch Patrol stood on the tarmac, awaiting only their cargoes of $H_2O_2$ before they set off for the Arctic base codename Baby Bengal up by the pole. At Bengal, the cargo they unshipped would shoot another observer up to those metal ledges high above the world.

Those metal ledges, falling perpetually at three miles a second or faster, maintained the perilous status quo below. Their observers watched and waited to order instant retaliation should hydrogen bombs be dropped. So the nations killed one another slowly with explosive bombs instead.

Tubby drove the fuelling tractor out to the further plane, an Arnheim, sounding his hooter as he drew up by the loading bay. 0428 hours.

The bay half-opened, and the solitary guard looked out. His mouth gaped in a luxuriously vulgar yawn.

" Where's Bert ?" he asked.

" He didn't feel so good. I sent him off," Tubby replied.

" Crafty devil. He owed me a quid. No wonder he felt bad. He knew I was on here tonight."

" Open her up, will you ?" Tubby said, unable to keep a note of tension from his voice. 0430 hours. Four minutes more.

The doors rolled open about him. the ramp uncurled. The guard came down the slope, shivering and buttoning up his snug suit, yawning again, scratching his skull.

" Take-off isn't till six-thirty," he said. " You're early, Tubby. Funny how everything you do in the services has to take place at some ungodly hour of the night. What a bloody ill-organised war it is, to be sure !"

Tubby let in the clutch, taking the tractor up the slope and moving into the aircraft. Here, he had only to back the massive tanks on the rear of the tractor into the great wall clips and secure them. This done, he paused ; on this flight, the tractor was needed too, or would be at the other end. He looked out of the door. The guard was stretching, indulging in one last jaw-cracking yawn.

0434 hours. The explosion sounded muffled. From the distant mound under which the buildings lay came a languid black puff of smoke. It subsided for a moment, then began to roll out with increased vigour. The damage, in actual fact, would not be great, and was intended merely as a diversion but from here it looked impressive.

" Hey, serious trouble over there !" the guard shouted. " Look ! Someone's dropped a fag end in the fuel."

" Or the enemy have got our range at last," Tubby suggested, running down the slope. As he came up to the other, he hit him smartly over the head with his service revolver. Then he turned and doubled back into the Arnheim.

He rolled in the ramp, he closed the doors, he roughly secured the tractor in place by jamming it to one side and tying it with webbing. He raced forward and climbed into the pilot's seat.

The rest was comparatively simple for him. He had flown these jobs in his training days. As he roared down the take-off lane, a flicker of fire caught his eye in the speeding dark outside ; it looked as if his little bomb had been effective.

At two thousand feet, he switched on the missile warp, rendering him safe from interception. His heart began to clatter less furiously. Wiping his face, Tubby headed South, climbing all the time. He had a rendezvous with Ed—a rendezvous it had taken three years and a lot of faith to keep.

Detective sergeant 'Cords' Corduroy plodded into his superior's office, a file under his arm, with only the most perfunctory of taps on the door. He drew up short. Talking to Inspector Arundall was a neat, severe man in a suit so deeply grey it was black; as Cords entered, he turned his head and fixed Cords with a harpoon-like stare.

"This gentleman is from Security, sergeant," Arundall said. "I have been telling him about the Pit."

Cords grunted and put his file down on the table, not giving the grey man a second look. It was a type he was allergic to.

"This is Detective Sergeant Corduroy," said the inspector. "He entered the Pit last week on top of a vehicle and left later by the same means."

"We have had our men in the Pit too," the Security man said, speaking without emphasis. "It is not particularly well guarded. No doubt when pressure of hostilities slackens somewhat, an Army unit will be spared to mop it up."

"The Pit has always been regarded by the Police as rather a good thing," Arundall said mildly. "It has served as a focus for delinks and criminals, keeping other parts of London relatively free from trouble. Inside it, the delinks form their own peculiar kind of discipline."

"Quite so," Security agreed. "But in the last two years, evidence tends to show that something more serious than mere lawlessness has established itself there, even that a deliberate attempt to sabotage the war effort may be directed from this Pit. I have received notice only this morning of a stolen cache of hydrogen peroxide which has been traced from an aircraft abandoned outside Aylesbury to a removals van seen driving into the Pit. My department can hardly believe that mere delinks, however well disciplined, are capable of stealing an aircraft."

Cords and his immediate superior looked at each other; the inspector nodded.

"I had better tell you what I discovered in the Pit," Cords told the Security man, picking up his file. "I don't suppose the name of the Rev. Edward Mullion will convey anything

to you. When war broke out, he was a parish priest working in the grimier districts of Paddington. He was presumed killed—with hundreds of others whose bodies were never recovered—on the night of the air raid during which the Pit was formed. He is not dead. Far from it. He is now the leader of one of the toughest delink tribes, who address him as ' Ed ' and treat his word as law."

The Security man changed his weight meditatively onto the other leg, and asked, " How did you come by this information, sergeant ?"

" I managed to obtain a few hints from a member of a rival gang," Cords said blandly.

" And this priest, Mullion . . . he surely is not still preaching the faith to these little hooligans ?"

" That's what I can't quite make out," Cords said. " That's why I'm going back to the Pit this evening."

A trans-continental ballistic missile whined overhead and crumped distantly in the direction of the White City. Cords did not even bother to look up. These missiles travelled sometimes half-way round the globe, never striking more than five yards from the centre of their targets. They were not only ruthlessly accurate: they were impossible to intercept or deflect. Air raids were nerve-racking affairs these days, with no possible defence but digging deep ; searchlights and A.A. guns had gone the way of the zeppelin.

Cords made his way across the Pit almost on hands and knees, dodging from one pile of rubble to the next. He was in lance corporal's uniform. At this early hour of night, the Pit was a noisy place, full of shouts and curses, a piquant mixture of children's playground and barrack room. In the ruins, Hide and Seek or less innocent games were being played, as for a brief hour the delinks forgot the ordeal of scrounging a living which occupied most of their thoughts.

When Cords had made his way to a stretch of the waste he recognised as being in Ed's territory, he stood up and flashed a torch.

" Where's Ed ?" he shouted. " Take me to Ed ! I want Ed ! "

He was tensed for trouble, but started all the same when Sponge materialised behind him pointing a Jadder gun at him. The delink seemed to sprout from the debris.

" Shut yer trap," Sponge said, " or you'll get to Ed in bits."

His woman, Ilford Lil, stood beside him. She carried a service revolver. Like magic, round Cords had appeared a circle of strained faces, some like babies, some like rats, ready to run or ready to kill. In the gloom, clutching guns or sticks or chains, they became a hobbledehoy parody of misery and sin. Snarling down anything further Cords had to say, they flowed round him, pressing him forward. Jostled, hacked, partly mobbed, he was pushed down filthy corridors into a tawdry room whose windows were barricaded by timber.

" Stand away from him !" Sponge shouted. " I found him first."

Reluctantly, the others fell back a pace.

" Lil, better go and get Ed here," Sponge said.

" Send one of these here kids," Lil said defiantly. " Why should I run all the errands round here ?"

He turned an entirely blank little face to her and half-closed his eyes.

" Go and get Ed like a good girl, Lil," he whispered.

She understood his tone of voice well enough ; without another word, she pushed through the crowd and was gone.

" Rest of you lot badger off," Sponge ordered. " Go on, git. Wait outside. Scram. Scarper. Bunk."

They left reluctantly. Sponge and Cords were alone, the former keeping a careful distance between himself and his captive, fingering the Jadder as if it were hot.

" What stunt are you trying to pull," Sponge asked pugnaciously, " coming in here yelling your head off ?"

Cords did not reply. Sponge launched into a stream of threats, all of which the detective received in silence. The delink made no attempt to come nearer for fear of getting rushed. Eventually he fell into a frustrated silence, avoiding Cords' fixed stare at him. Cords could easily have overpowered him, but that was not part of the scheme.

When the door opened again, Sponge's dead-pan slumped for a moment into an expression of great relief.

With Ed were Barney, Chuck the Chucker, Tubby Turner and one or two other stalwarts. Ilford Lil sidled up to Sponge without looking at him.

Ed wore a plain black surplice which had acquired a pattern of burns and stains all over it. He was not a striking-looking man ; Cords had been prepared for someone bigger. But in a pale face, beneath fair, bushy eyebrows, two pupils almost

black stared out penetratingly at the world. When those eyes rested on you, you knew Ed was a Napoleon in his own sphere, a man who commanded by something more than logic.

" What is your name and what do you want ?" he asked Cords.

" My name is Joe Striker," Cords said, giving the story he had prepared with Arundall. " My son Conny came over to you while I was in the army. He got killed by a fly bomb about a month ago."

" We heard the cops had got Conny," Barney said.

" I got a letter from the Home Office saying he was killed in Hammersmith," Cords said, producing the forgery and waving it at them. It had actually been the arrest and interrogation of Conny Striker which had given the police a lead on the raid on the *Sherbourne Drive*. " So I deserted and came to look you out."

" Oh ? Why ? " Ed asked sharply.

" Just something Conny let out once when I was on leave. He said you had an interesting little project here and I thought I'd come and help you out."

He met Ed's eyes for a moment, then dropped his own.

" Joe Striker, no man alive can lie to me without my knowing it," Ed said. " I have received the word of God, and He tells me who lies to me. He tells me you are lying now."

" Well . . ." Cords said, with seeming reluctance. " I admit that's not quite the real reason I gave you. But Conny always said you were on the up and up and . . . and my brigade is about to be drafted overseas to the Ukraine. I couldn't face that, so I—I came here."

The delinks about him relaxed. That was the sort of explanation they could understand.

Ed looked hard and piercingly at him.

" What sort of things can you do ?"

" Do ? What sort of things do you mean ?" Cords asked.

" Could you—repair a ventilation system, for instance ?"

" I could have a try."

" You're on Striker—provisionally. Make one silly move and the boys will tear you to pieces. Sponge, find Striker some sort of a doss for the night, and see to it he attends matins tomorrow morning."

If ' matins ' had ever been a religious ceremony, all traces of its origins were now lost. Held in a large, smoky hall

which had once been a restaurant, it was more of an informal roll call than anything. Ed was not there at first. Chuck the Chucker came forward and delegated various tasks to the boys and girls present. Fully half of them were ordered to pinch what they could—food, money or valuables—and assigned a pitch in which to operate.

" You see, we're organised, kid," Sponge said proudly, as he stood with Cords. " Ed's made something of us. We're like a ruddy little army here. All the rest of the mobs in the Pit—they haven't got a clue. Anyone laying their hands on Ed, I tell you, they'd get the living daylights battered out of them."

He stopped abruptly, aware of Ed approaching, and made his face as blank as a concrete path. No doubt he had startled himself with his own eloquence. He pulled his pipe from a pocket and stuck it between the ruled line of his lips.

" Striker—will you come with me?" Ed said, nodding to Sponge. He set off at once without looking again at Cords, moving through the noisy crowd which parted at his approach. Passing a guard, they climbed down into the basement of the restaurant. Here, at one end, a tunnel had been driven underground, its sides sandbagged, its roof shored in an efficient manner.

" We done this," Sponge said quietly, with pride.

The tunnel continued only for some thirty feet, after which they climbed again to ground level, emerging into the boiler room of a church. Upstairs, the old pews had been cleared and an extraordinary amount of electrical equipment, some of it in use, lay about. A fuelling tractor was parked by the font ; only a few days ago it had been working in North Greenland. The windows had been boarded up ; the scene was lit by electricity.

Cords looked about curiously. This was not what anyone would expect to find in the middle of the desolation of the Pit.

" This was once my church," Ed said. " When the bombs fell, they could not destroy it, though everything round it was destroyed. Do not think that we have desecrated it. All we do here is done in God's name, and what we shall do here will be to God's greater glory."

Cords glanced at him quizzically.

" So you still count yourself a priest?" he said.

A spasm of withering anger passed over the pasty face and was gone.

" I serve as I have always served," he said, " among those who have most need of me. I can see you are a stolid, unimaginative man, Striker ; you think of me only as a leader of a delink gang—but soon I shall be seen as a new Noah, as a saviour of man. Everyone will acknowledge me."

Seeing the reserved look on Cord's face, Ed turned sharply on his heel with a curt, " Follow me." Walking down what had once been the aisle, he pulled aside the filthy curtains which cut off the belfry.

Exclaiming involuntarily, Cords stopped dead. He stared in fascination. The original belfry had been considerably widened. Inside the tower, like a shell up a flue, stood a gigantic rocket, its nose almost touching the tarpaulins which had replaced the steeple. A couple of delinks, dwarfed, looked round from the base of the rocket at which they were working, saluted Ed, and went on with their job.

" This way," Ed said. With Sponge and Cords following, he went over to an open lift built among the web of scaffolding which surrounded the rocket.

" But . . ." Cords began. He could not think of any words. He stood dumbly as the platform rose rapidly beneath them and the bulk of the rocket slid impressively past their eyes. They stopped when they were almost at the top, with only a few feet of rocket above them. On the black hull was painted a name : *The Ark.*

" This space ship," Ed said quietly, " is going to carry us forever out of the Pit, away from Earth to Venus and a new, purer life."

" But nobody has been to Venus," Cords protested stupidly.

" Exactly. We shall have the chance to begin again that the inhabitants of the first Ark had." He led the way through the port in the top stage of the rocket. Cords followed. He was too tall for the low compartment and had to bow his shoulders, but Sponge and the priest, being smaller, stood upright.

Everything about him was trim and unbelievably shipshape. He found himself recognising many things he had seen only in films : acceleration couches, racked space suits . . .

" This . . . doesn't work, I suppose ?" Cords said. He was just making a noise with his mouth ; temporarily, his brain had ceased to function.

" I'll show you the ventilation system," Ed said, climbing down a steel ladder. They passed through a chamber crowded with narrow, upright bunks, stacked close together.

" Room for twenty-five passengers here," Ed said, in passing. " The voyage is only six weeks long, but we can't possibly carry food, water, air for them. They'll pass the time drugged. Sponge here was a patient in Bart's recently, so we now have a good supply of serum. Through there is the engine room."

It was as cramped as elsewhere, and as orderly. One section of panelling stood on the floor, revealing a small reciprocal pump.

" Here's the vent system," Ed said. " I suppose you know your son Conny was working on this before—he left us ?"

" Er . . . yes, he told me," Cords said, still dazed. " I'll see what's wrong. Look, Ed, this stuns me. Can I get this straight ? You mean to say you built this thing—this space ship, your gang built it, these kids . . . and that's it's really going to fly ?"

Sponge laughed. Ed thrust his hands under his cassock and fixed his unnerving eyes on the detective.

" No, we didn't build *The Ark*," he said. " It was God's gift, and we merely worked on that. He spoke to me and I was guided. Our first stage rocket is a British trans-continental guided ballistic missile which fell into our hands accidentally ; over three years ago, a trailer-driver lost his way in the fog and drove into the Pit with the missile in tow. I saw at once what God's purpose was.

" Since then, we have worked hard. None of us knew anything about space, but we have learnt, with guidance from above."

" How did you learn, when nobody's been to Venus yet ? How did you build all this ?" Cords asked, waving his hand rather wildly.

" The information and the material were already in the world. All we have done is to collect them. It could almost have been done twenty years ago, back in 1955—but there was no war on then, to cloak our activities. Whatever was needful for us, the Lord has provided ; now we even have the last measure of the fuel we require, and all is almost ready. He helps those who help themselves, if they deserve help."

His sharp gaze saw Cord's eyes slide over to take in Sponge, almost the typical delink, with his slick but grimy clothes and tough, dead face.

" I know what you're thinking," Ed said sharply. " You're wrong. If anyone needs help, these poor fallen children, girls and boys, do. They have never had a chance. Here I keep little curb on them. On Venus they will be shown the true way. Nobody will stop me now—certainly not you. Put your hands in the air."

As he spoke, the priest brought a gun out from under his gown and pointed it coolly at Cords.

" With God's help, I'll blow you apart if you make one move," he said. " Get your hands up above your head."

As he obeyed, Cords said, " What's the idea of this ?"

His thoughts raced. He could rush the priest with a fair chance of knocking the gun away before it killed him—they were only ten feet apart. But this kid, Sponge, he was now swinging a padlock and chain in a hungry fashion. Two against one : no, the set-up was not so nice.

" You are an impostor, sent perhaps by the police," Ed told him coolly. " You said that Conny Striker told you he was working on this ventilation system. He was not. He was only a guard, knowing nothing about *The Ark* at all. When you appeared yesterday, the One who is over us all told me you were not what you claimed."

" I hope He also told you—" Cords said, and launched himself at the priest. He had always made up in courage what he lacked in brains.

The gun exploded almost in his face. Its roar blinded and deafened him, spilling pain through every nerve, seeming to swill back and forth for ever in the confines of the engine room. Cords was engulfed in this mixture of agony and noise ; he could not fight his way out of it. When he struggled free, it was to find himself lying face down on the floor with a useless, bleeding right arm.

Groaning, he rolled over and looked up.

Ed stared down at him, eyes blazing.

" My Master has provided me with a quick and accurate trigger finger," he said. " I could have killed you had I wished. You must be thankful I also am merciful."

Sponge looked almost as shattered as Cords. The surprise of the shot had broken through his surface toughness ; he was now just a frightened boy. He leant against a bulkhead, his padlock swinging idly from one hand, trying not to be sick.

With an effort, Cords sat up, clutching his arm and cursing.

" Why didn't hou kill me ?" he asked.

For once, the priest seemed to hesitate.

" I'll tell you," he said. " You are needed, in a small way. Everyone has their part to play in the grand scheme of things. *The Ark* is all but ready to launch itself into God's heavens. Blast-off is in two days' time—nobody but Barney and I, who have worked out the maths, know this. Now you and Sponge also know it. Our gang here numbers over sixty ; only twenty-four of us can be saved ; there is room for no more. We chosen ones must leave secretly, or there will be treachery and bloodshed. Some of the ungodly must perish to save the righteous."

" Where do I come in ?" Cords asked.

Ed made a restless movement.

" What I have done here is superhuman," he said slowly. " Yet I still have human weaknesses ; on Venus I shall purge them with mortification. But I cannot go without a reliable witness to stay behind and tell the world that I still live and that I have achieved all this. Look on my works, ye mighty ! The name of Edward Mullion must not go unremembered. You will stay here, suitably confined. When the ship goes up, half London will hear it, and the military will invade the Pit to find out what has happened. You will be here to tell them. Sponge, tie him up—there is some wire in that locker behind you."

Cords staggered to his feet. The revolver was instantly aiming at his stomach.

" I can easily find another prophet to cry my name if you play the fool again," Ed said. " Quickly, Sponge, pull yourself together : the wire, boy."

Moving in a daze, Sponge fetched the wire and lashed Cords' hands behind his back.

" Better," Ed approved. " We'll leave him up here, I think, till blast off, out of harm's way. He may never get nearer to Heaven."

" My arm," Cords protested. " It needs attention."

" Nobody ever bleeds in vain," Ed said. He laughed suddenly, an ugly noise like a pitcher breaking. " Secure him to that auxiliary door and tie this rag in his mouth."

Trembling slightly, Sponge did as he was told. Ed surveyed the handiwork, pronounced it good and led the way out. Cords heard them go through the sleeping chamber and climb

the ladder. He heard them pass through the control room and out onto the platform of the lift. He heard a thud, followed by a long and terrible scream, which rose—and ceased with the suddenness of a dream.

Silence, then a fearful clatter and thump, and Sponge was back in the engine room, standing wildly before him

"I done him," he shouted. "I clocked him one with my chain. He was mad, real stark, staring, raving crackers! I only just cottoned on. He'd have killed us all soon as look at us. I had to do it, mister."

As he spoke, he was tearing Cords' gag away, wrenching at the looped wire.

"You got to help me!" he said to Cords. "The others—Barney and Chuck and all the lot, will be up for me in a minute. You can talk to them! You got to tell 'em why I did it, how Ed was crazy, how he thought he was God."

"I'm going to tell them this rocket is crazy," Cords said. "None of you are anything but amateurs. There must be a thousand factors you will have overlooked. This damn machine will kill you all if you try to raise it. You'll never reach the first cloud, never mind Venus."

He winced as his hands were freed, and headed unsteadily for the ladder.

"The rocket's got to go," Sponge said. "It'll go. We'll be O.K. without Ed. We can't stay here."

"It won't go. It'll blow up, you little fool. Ed was no astronaut. None of you are proper engineers. This is just a dangerous toy you've built."

He was in the control room now. Looking round, he spotted the shortwave radio. It was Army stock, filched from a Bevan tank. As he sat down in front of it, the lift sank away outside the open hatch; shouts rose from below. The wolf pack was gathering.

"They're coming! They're coming!" Sponge cried. "What are you doing?"

"Shut the hatch, man, what are you thinking about?" Cords said. "I'm going to contact Scotland Yard and get the squads here fast."

He had not opened up and begun calling before Sponge was on him. The flailing padlock, missing Cords' skull, cracked against his shoulder. Deliberately, he flung himself backwards, feeling the wind whistle out of Sponge's lungs with the impact.

" They'll . . . kill . . . us . . . both," Sponge gasped, rolling from under Cords. As he spoke, the grim figure of Barney nursing a Jadder gun rose to a standstill, framed in the oval hatchway.

" Get up, the pair of you !" he said. He was crying ; the light of his world had gone out. " Killing's too good for you!"

" Barney ! It wasn't me ! It was him !—It was him—he's a copper ! " Sponge shouted, dashing forward, The machine gun barked. He nearly reached Barney's feet, his fingers groping forward on the deck.

Cords did not move. He closed his eyes and waited. There was not long to wait.

*The Ark*, with Barney in control, blasted off according to schedule with eleven girls and fourteen boys aboard her. As the first space ship, she was a shining example of what fanaticism can achieve. With her take-off, she obliterated almost half the Pit : with her crash landing, five seconds later, she obliterated the other half.

*Brian W. Aldiss*

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# THE LITERARY LINE-UP

Next month, our first issue of the New Year, has three long stories making up its basic contents and sees the welcome return of author Ted Tubb with " Requiem For A Harvey," his first new story for us in two years. You will need to get the issue to find out what a " harvey " is. Dan Morgan and Kenneth Bulmer share more honours with " The Unwanted " and " The Unreluctant Tread " respectively, and there will be a short Robert Presslie story entitled " The 40th of December," plus a Kenneth Johns article.

But the greatest honours go to the climax of John Brunner's serial " Threshold of Eternity " which packs a number of terrific surprises in its closing instalment.

Story ratings for No. 63 were :

1. The Uninhibited - - - - - Dan Morgan
2. Made On Mars - - - - - E. R. James
3. Mission One Hundred - - Kenneth Bulmer
4. The Watcher On Sargan IV - - Peter Hawkins
5. Sister Under The Skin - - Bertram Chandler

# INTERPLANETARY NAVIGATION

*Alan Barcloy, who is an experienced lecturer and writer of scientific articles os well os fiction, presents o topical neor-future orticle in this dawn of the Spoce Age. He takes interplanetory travel just a little further than the satellite stage ond points up the most importont factor governing planetary voyages.*

## By Alan Barclay

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It is impossible at present to discuss interstellar navigation in detail, simply because there is no solid technical information available about the sort of ships that will make such voyages ; we cannot guess what will be their speed or acceleration, and above all I very much doubt whether the effects of relativity time-shortening have ever been correctly forecast even by our best science-fiction writers.

In a very general way, it is permissable to predict that navigation of the Big Ship drifting through space in free fall for centuries while its occupants live, reproduce, and die in it will be a simple and leisurely business. A course check once every year is probably all that will be required.

Anything said about navigation in hyper-space—if such a concept has any physical reality—can only be mere speculation. Some writers suggest that the stars will be invisible during such flights ; in that case navigation will be a matter of pre-set courses, with occasional " surfacings " into ordinary space for position-checks. Should the stars be visible however, navigation might reduce to the simple procedure of pointing

the ship towards its destination, then pressing the button which will cause it to shoot towards it.

Navigation between planets within our own solar system—or navigation between the planets of any other solar system for that matter—is something about which we can really get down to details.

Navigation is an art which is keyed to economics. Economics mean fuel costs, costs of engines, rate-of-wear of engines, ship-crew salaries, landing fees, and a host of items of that sort. If the cost of such things did not matter, the fact that the ship might stray off her course and take longer on the voyage would not matter. Even if the ship ran out of fuel altogether—a point which several readers will be anxious to make by this time—it would not matter, for a rescue ship could be sent out, and by hypothesis the cost of doing so would not matter either.

But it is very likely that regular Earth-Mars voyages will be undertaken within the next fifty years or so, and fifty years from now, cash will still be important. Fuel will still have to be paid for ; crews—except perhaps for the pioneers who make the first voyages—will want salaries and pension schemes for their widows ; ground personnel, radio-ops, radar fixers, mechanics and technicians will do their jobs to some extent for love of the business but to some extent also for the purpose of earning a living.

In the U.S.A., where big business is really big, writers have found it possible to discuss interplanetary voyage finance in terms of private companies operating for profit, but I cannot go along with this ; to me it seems impossible that the stupendous costs could be met by anything else than a World Government. Even so, economics will matter. Taxpayers all over the world will want to be sure their money isn't being squandered, and eventually they will ask to see some return for it, perhaps in the shape of flourishing colonies out on Mars.

The most economic route is not necessarily the one which requires the least amount of fuel, because less expenditure of fuel means a longer voyage and a bigger wages bill. In addition, the best overall economy might result from transporting three cargoes per year instead of two, even if the cost per voyage was increased. But higher fuel consumption implies higher thrust, higher temperatures in the jets, a faster rate of wear and earlier need for replacement—and some

cargoes are more valuable and more perishable than others—and sometimes Mars is near to Earth and sometimes not.

The most economic path from Earth to Mars at any instant must therefore be calculated from a complex integration involving about a dozen variable factors such as distance, difference in planetary velocities, fuel cost, salaries, rate of wear of engines, nature and perishability of cargo.

Time to call in the mathematicians.

The problem however will cause them no great difficulties for it is no more difficult than many which already exist in engineering economics. During the 1939-45 war, for instance, mathematicians dealt with the following question : " What is the optimum flying speed and search-pattern of an anti-submarine patrol flying-boat in order that it shall cover the largest area of sea during each sortie ?" Note that the fuel capacity is a known constant, that by increasing flying-speed a given strip of sea can be covered quicker, but the fuel consumption per mile increases, and that there is an infinite number of search-patterns.

The solution to that little problem was something involving double integrals.

My own view is that the mathematicians can dispose of the interplanetary problem once and for all by constructing a rather complicated diagram resembling a nomogram. From this the navigator will be able to read off his optimum course and velocity for any set of circumstances.

Having been provided with the best curve and acceleration gradients, the ship navigator's job is to stick to them as closely as possible. The closer he sticks, the more economical is his voyage, and (no doubt) the bigger his bonus.

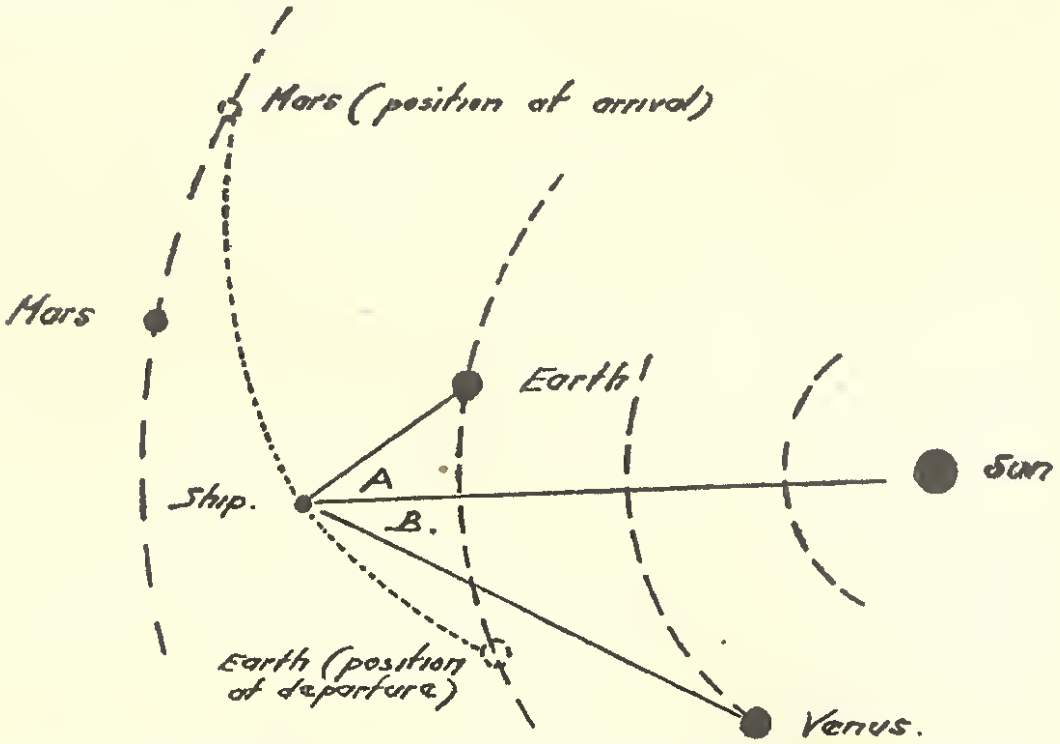
It is possible to travel with continuously changing direction (every motorist does it), but it is not an easy thing to do with a big ship. Theoretically, an ocean-going liner on a great-circle course should travel continuously on a curve, but in actual fact it steers on a fixed compass course for agreed periods. Aircraft on great circle flights change course every twenty minutes or so.

Therefore it seems likely that space-ships will travel on a series of short straights which will approximate to the theoretical best curve.

Assuming that fuel consumption is not an over-riding problem I see no difficulty in achieving a continuous change

in velocity. In fact, a steady gentle acceleration (or deceleration) will produce a small gravitation which will be very welcome to crew and passengers.

Having in the course of the last thirty years been concerned with structures, engines, explosives and projectiles, I have developed towards all such things a deep and irremoveable cynicism. I do not believe that rocket fuel will ever be made to burn quite uniformly ; I shall never be convinced that the pumps which send it out to the jets will supply a steady flow ; I am utterly convinced that in the course of each voyage the jets will erode in an unequal and unpredictable manner, and I am prepared to prove that it is theoretically impossible to mount jets so that their thrust is perfectly aligned with the axis of the ship.




With all these factors—and I can produce as many more—operating in a haphazard and random fashion, the notion of pre-calculated courses is sheer nonsense. The space-ship navigator's job will be no sinecure ; he really will have to make position and velocity fixes and calculate course and thrust corrections.

Of course, he will make position-fixes on the stars, you will say. But will he ?

During a voyage from Earth to Mars—a mere sixty million miles or so—the relative position of the stars will not change

at all. (I can prove this from personal observation, and so can you. In the course of half a year during which time the Earth has shifted position about 180 million miles, the angular interval between stars does not alter more than a few seconds of arc).

There are difficulties about determining even direction by reference to the fixed stars, for no guarantee can be made that the ship will travel in the direction of its longitudinal axis. I believe however that the direction can be determined by means of a gyroscopic compass.

The best method of fixing position during interplanetary voyages is the ancient device used in coastal navigation, a three-point bearing on prominent nearby objects. The prominent objects in this case cannot be lighthouses or church spires, but the sun and our neighbour planets will be just as visible as the church spire. These admittedly are not fixed but their orbital position at any instant can be determined.

The method is shown in the diagram ; from the ship the angles A and B are measured. An ordinary ship's sextant (the best of which costs about £80) will do the job nicely. Having read off these two angles, one must solve a rather awkward trigonometrical formula, known as the three-point problem, to find one's position ; but even this can be avoided if the seamen's gadget called the station-pointer is used.

Due to the fact that these observations will be made on moving objects, the time of each observation must be noted very exactly, and in fact this will be the trickiest part of the whole procedure.

The archaic gadgets I have described—affairs of graduated brass rods, may be a disappointment to many readers, who will have been expecting electronic devices. The fact is, I mistrust electronic devices, and I am not alone in this. Only last month I consulted a specialist in computers ; he believed also that something made of graduated brass rods is preferable to any electronic box of tricks. It is simple and robust, and its operation is visible and understandable ; it cannot go wrong.

You will gather indeed that I am not in favour of too much mechanisation, too much in the shape of electronic wizardry and pre-computed mathematical magic. I believe there will always be a job for pilots and navigators. They are tougher, more robust, intellectually far more flexible, and in general occupy far less room than any computer. Furthermore, they are self-repairing, and they are produced entirely by unskilled labour.

*Alan Barclay*

*The style and presentation of this story is completely different to that generally used in a fiction magazine. It is, in fact, the manner in which newspaper sub-editors receive their news from correspondents and agencies. Not surprising therefore that Peter Phillips, who is chief sub-editor of the features department of a national daily paper, has used this form. The plot happens to be particularly applicable, too, having been written between the launching dates of Sputnik I and II.*

# NEXT STOP THE MOON

## By Peter Phillips

TWO P.M. G.M.T. FLASH : MOSCOW, OCTOBER 9, 1959 : RUSSIANS CLAIM FIRST MANNED SATELLITE IN ORBIT ROUND EARTH. TWO-MANNED SPACE CAPSULE WILL ORBIT EARTH FOR WEEK, FORTNIGHT, MONTH ACCORDING TO CONDITIONS FOUND. FIRST SPACEMEN NAMED : GEORGI KRUSHENKO, DMITRI LOPAKHOV. GRADUATES LENINGRAD SCHOOL SPACE MEDICINE.

2.30 P.M. G.M.T. FLASH : MOSCOW, OCTOBER 9, 1959 : NEWLY-APPOINTED MINISTER FOR OUTER SPACE, PROFESSOR BLAGONROV, SAYS ALL MESSAGES FROM KRUSHENKOV, LOPAKHOV, WILL BE VERBAL, IN CLEAR, UNCODED ON 24-PLUS, 34-PLUS, 263, 294 METRE BANDS. SAYS BLAGONROV : " WE ARE NO DOGS IN MANGERS, LET WHOLE WORLD SHARE WHAT RUSSIANS HAVE ACHIEVED."

Washington, D.C., 9 a.m. Eastern Standard Time (3 p.m. G.M.T.) : Edited extract from radio-television interview with Colonel Mack Houston production and development head of the United States satellite project SAM ONE . . .

" . . take it easy fellers. I haven't even had breakfast yet. Let me have a drink of this coffee. Hey—is that goddamn camera live ? Shut it off. I can't even stand my own face this time of the morning.

" This is an invasion of privacy . . . All right, I'm not claiming privileges above my station. I'm just a whipping boy. Go ahead and whip.

" But one at a time . . . You there, mister—the *New York Times* man . . . Fire away with your questions, son. Right . . . I'll say this : IF the Russkis have got a couple of men into an orbit at 600 miles, and IF those men are in sufficiently good shape to report back for a reasonable length of time, and IF they can get back to earth at the end of that time—then, okay, the Russkis have licked us into space.

" But, gentlemen, we are not so careless of human life as the Russians. It may be that the prolonged, crushing effect of acceleration, followed by the terrifying physiological and psychological effects of weightlessness in orbit, will have killed these two poor, conscripted devils like experimental animals—"

Bob Reevers, of the *Denver Post*, interrupts : " Nice long words, but aren't you sticking out your neck a little way, Colonel ?

" Remember, two years back, someone in your department said about the first unmanned satellite sent up by the Reds : ' Just a hunk of useless iron.' But they got enough information from it to beat us to the punch."

Colonel Houston : " What sort of American are you, son ? Okay, okay, gentlemen . . . I apologise . . . No slur intended on your colleague here. And believe me, I don't want to belittle the Russian achievement—if they have achieved anything.

" But according to these radar reports and the Moscow information, that—thing—was launched five hours back, and there hasn't been a peep from it since.

" Keep in mind it would take only five minutes to get into orbit . . . I figure the Russkis have shot their mouths off a little too quickly this time. Anyone can hurl a couple of dead dogs into space.

" As far as I'm concerned, hearing is believing. Lieutenant —turn on that short-wave junk over there. If you can't get anything, try medium band.

" Coffee, gentlemen ? "

*4 p.m. G.M.T. Transcript of message received in part by B.B.C. monitoring station at Tatsfield, on the Kent-Surrey border—and, of course, by the monitoring stations of other nations.*

" . . . Certain technical data in Russian which no doubt you will have translated, including *y lublys ya*, which means ' I love you ' and was meant to be heard by only one person among you millions down there—and she doesn't live more than a light-year from Novaya Street in Moscow.

" I am sorry speaking of a private matter when my friend Dmitri and I are the two most public people in the history of the world, and I am now showing off my not-so-good English in very much public. But I am not ashamed.

" Say something for the people of the earth, Dmitri, you great hero."

*At this point in the transcription there is a deep groan—presumably from Dmitri Lopakhov. The speaker, Georgi Krushenko, resumes.*

" Dmitri is sick. Sick as a dog. And I am very unwell. But we heard the sound element of a television broadcast from the United States a short while ago, before we could start reporting and a Colonel Whostown or Houseton said we were not sick dogs but dead dogs.

" Now I see the eastern sea-board of the United States coming beneath us in our two-hour orbit, and I know he can hear me direct what I say, and that's why I'm using my English.

" Colonel, dead dogs can't bark. GRRROWWW ! YARRRP ! Bark Dmitri—BARK ! "

October 10, 1959. Digest of headlines from U.S. Press : REDS SNARL FROM SPACE : RAZZ FOR HOUSTON HEARD BY WORLD . . . RED DOGS YAP, WORLD LISTENS . . . FIRST SPACE-MEN SAY : ITS HELL IN HEAVEN . . . SPACEMAN PLEADS LOVE FROM 18,000 M.P.H. ORBIT . . . HEY GEORGI—WHO'S THE DAME ?

*Daily Herald* Space Correspondent, Woomera, Central Australia. October 10, 1959.

Doctor Abner Oldcastle, head of the Commonwealth space station project here, said today : " It's a bloody marvel. Good luck to them."

While the world awaits details of this Russian technical achievement, stocky, 56-year-old philospoher-scientist, Dr. Oldcastle insists that it is a triumph of men, not machines.

He believes that the Russian space-men, 22-year-old Georgi Krushenko and 20-year-old Dmitri Lopakhov, must have been given special physical and psychological training to withstand the take-off from earth and the conditions of outer space.

Giant centrifuges to increase their weight, parabolic flights in planes to cancel out their weight for as much as a minute at a time, hypnotic conditioning against claustrophia and agoraphobia (*fear of open space*).

" That's the drill for our lads here," said Dr. Oldcastle. " Let's hope the Russians gave it to those lads up there. Otherwise . . ."

" Otherwise, what ?" I asked.

He poked towards the ceiling with the stem of his pipe.

" Otherwise," he said, " we're liable to have a couple of lunatics circling the earth."

11.15 *p.m. G.M.T. October* 10, 1959 : *B.B.C. translation of Russian-language broadcast from satellite* (*Tatsfield to Broadcasting House*). *Full.*

" Dmitri Lophakov reporting : Temperature readings from satellite skin : 250 Fahrenheit sunside, minus 200 earthside ; scintilometer and geiger show we must be absorbing more than four milliroentgens per hour from secondary cosmic particles; velocity, 18,300 miles per hour ; altitude, 600 miles at closest approach ; humidity in satellite ninety, and Professor Blaganrov can go and get himself stuffed.

" No real disrespect intended, Professor, but, up here, all values go by the board. Did I say up ? There is no up and no down. We don't know whether we are falling back to earth, or earth is falling on to us.

" It's like the feeling you get when a lift starts going down . . . but it goes on and on and on . . . We are falling through the bottom of the universe and nothing matters a damn except to tell you about it. You and the stars—white blobs of crystal paint on black velvet. You've never seen the stars like this. We're drunk with looking at them.

" Here comes Georgi, floating towards me. He says that by one of your million to one chances—remember your calculations ?—our nitrazine fuel tank has been holed by a meteorite. Which means we can't use our rockets to slow us below orbital speed so we can return to earth.

" So we'll have to stay up here, won't we ? At least, the satellite will. For ever and ever. We shall die, of course, in about seven weeks.

" *But what a wonderful coffin we have.*"

*Daily Herald Reporter*, Moscow, October 11, 1959—After an all-night session with top scientists at Moscow Academy, Russia's Minister of Space, Professor Blaganrov, white-faced and unshaven, emerged at 9 a.m. to say : " Only a miracle can get those youngsters down."

ASKED BY A FRENCH RADIO REPORTER : " WHY WASN'T THE POSSIBILITY OF A METEORITE COLLISION ALLOWED FOR ?" THE 60-YEAR OLD, GREY-HAIRED MINISTER APPEARED TO BE CONTROLLING HIS TEMPER WITH AN EFFORT.

He snapped : " It was a million—a *millions*—to one chance against the nitrazine fuel tank of the rocket being holed by a meteorite. If we had to make allowance for such fantastic improbabilities, the satellite would never have been launched.

" The pay-load had to be calculated to the last pound. To have included an extra 150 pounds of fuel as a reserve would have involved increasing the original weight of the three-stage rocket which put the satellite in orbit by 75 tons, and this would have altered many other calculations."

I asked : " Doesn't Russia have another rocket to reach their orbit and take them fuel ?"

Blaganrov said : " I answer your question simply, young man. When you build your great ocean liners, do you make them in duplicate in case the first one sinks ?

" The manned satellite represents many years of work and many billions of roubles.

" And, technically, as your scientists can tell you, only a satellite can refuel another satellite . . ."

•

1 *p.m. October* 11, 1959, *B.B.C. Monitoring Station, Tatsfield, Russian Section. Translation of message from manned satellite.*

" . . . Dmitri says that talking uses up oxygen and the more we talk, the sooner we'll—pass out. He's a fine one ! Like most Ukrainians, he could talk the tail off a comet.

" He's not serious, of course. It could make a difference of only—say—ten minutes in the 25 days we've got left, according to our latest calculations. Mind you, we'll be pretty muzzy, by then—after a certain point, the regenerator won't be able to deal with the excess carbon dioxide in the atmosphere.

" But we'll keep up our routine six-a-day observational reports as long as we're . . . as long as we can.

" And in between times, I'll talk when I feel like it—or rather, when young Dmitri isn't hogging the transmitter. And incidentally he's sorry he insulted you yesterday, Profes-

sor Blaganrov. We're both a bit light-headed, as well as light-bodied. Perhaps that's why we're not as worried about the idea of us—dying—as you are on earth.

" It's so quiet and beautiful and . . . and *clean* out here in space. I swear when we turn off the radio, we can hear these great bright stars singing to us. It's like the peace of the heaven my mother talked about when she tried to get me to go to church. Maybe she is a little bit right."

Digest of United States newspaper headlines :

RED SPACEMEN SAY : WE REPORT UNTIL WE DIE . . . SPACEKIDS FACE DEATH WITH SMILE, MAKE CRACKS . . . SAY, MRS. KRUSHENKO, THAT'S A FINE KID YOU GOT UP THERE . . . . CAN ANYTHING BE DONE TO SAVE GEORGE DMITRI ?

Extract from leading story by Art Mason, New York *Herald Tribune* Science Reporter.

" . . . incredible switch from the ' sour grapes ' attitude of U.S. leaders three days ago—led, I am bound to say—No, *proud* to say—by public opinion.

" And this opinion can be summed-up—as so many things are—by my cab-driver this morning :

" Hell, they're not just Russkis stealing a march on us. They're the first men in space. We gotta do something. We can't just leave them to die up there.

" My old lady says at breakfast : *We're so smart with our sappelite, moon-men things we talk about so much, let's get right up there, get those boys down.*

" *And what about his momma there in Moscow* ? says my old lady, *there she sits worrying fit to sick up her heart, and her a good church-going woman. Don't just sit there, ya bum,* says my old lady. *Get outta here and do something.* And she chases me out. Okay—so can anyone do ANYTHING ? —except pray ? "

MOSCOW, OCT. 11, 1959 : B.U.P. : PRAYERS FOR DOOMED SPACEMEN GEORGI KRUSHENKOV AND DMITRI LOPHAKOV SAID IN PACKED RUSSIAN ORTHODOX CHURCHES THROUGHOUT U.S.S.R.....

Extract from *Daily Herald* leader, October 12, 1959 : " . . . and the offer of help by Dr. Abner Oldcastle, in charge of the Commonwealth satellite project at Woomera, will be applauded by the world. Why is America waiting ?"

Extract from personal coded diplomatic cable, President U.S.A. to President U.S.S.R., 12 p.m. G.M.T., October 12, 1959 : " . . . had to wait for emergency session of Congress committee to clear powers . . . all aid civilian and military . . . suggest you get Blaganrov and aides here and on way to base before story breaks."

Extract from *Daily Herald* main front-page story, October 13, 1959.

ROCKET KILLER MAY SAVE THE SPACEMEN.

Early this morning, Washington released the news that a killer rocket, originally designed to shoot down any successful manned " spy " satellite, may be used to rescue the two young Russians now in space.

Professor Blaganrov, Russia's " Minister of Space," and a dozen Russian satellite experts, flew into Washington yesterday and are now on their way to the U.S. space-project base at Cape Canaveral, Florida to discuss the possibilities with U.S. experts.

Britain's Doctor Oldcastle is now en route by strato-jet from Woomera to join them, accompanied by his 16-year-old son Peter.

These amazing and heart-warming developments were prefaced by a series of news-releases, radio and television interviews unprecedented in their frankness.

The first of these must be the admission by Colonel Mack Houston, head of America's space-station project. He said in a radio-T.V. Programme :

" All right, I was wrong to describe those Russian kids as ' dead dogs.' They're surely barking. And I want 'em to stay that way.

" We've had a three-stage rocket with an H-bomb warhead lined up for three years now, ready to take out the Russkis if they used a manned satellite for war purposes. It can be given orbital speed—but whether it can be converted to get fuel to those kids—that's what we've gotta talk about . . ."

*B.B.C. Monitoring station, Tatsfield,* 10 *a.m., October* 13, 1959 :

" . . . sleep is our great trouble. Both Georgi and me take methedrine hydrochloride to keep awake. When our eyes are open, we can force ourselves to think there is an ' up ' and a ' down ' and orient ourselves . . .

" . . . with our eyes closed we have the nightmare that has haunted all men since our ape ancestors fell from a tree-branch in their sleep—the fear of falling, falling, falling . . . Crazy, isn't it? Since that's what we want to do—fall back to earth. Heard Colonel Houston's broadcast. Good luck, Colonel. We're still barking ! "

CAPE CANAVERAL, OCTOBER 14, 1959 : WORLD SCIENTISTS, COMPUTER EXPERTS, TODAY SAID U.S. ROCKET CAN REACH SATELLITE SPEED AND MATCH ORBIT FOR TRANSFER OF FUEL TO RUSSIAN SATELLITE WITH PAY-LOAD OF 300 POUNDS, BUT ONLY WITH HUMAN PILOT WHO MUST NOT BE MORE THAN NINETY POUNDS.

Extract from shorthand transcript of conference in space-field office of Colonel Mack Houston :

" . . . quite impossible. We'd need a space-trained midge."

*Doctor Oldcastle* : " Or a seven stone space crazy boy."

*Houston* : " What are you getting at, Doctor ?"

*Oldcastle* : " My son, Peter. He weighs just under 90 pounds. Come out here, Pete, and have a look at that brute over there. Do you think you'd make a good substitute for an H-bomb at the business end ?"

*Peter Oldcastle* : " Why do you think I came with you, Dad—if it wasn't for a chance at that . . ."

October 15, 1959 : Part of world-network radio interview with Russia's Minister of Space, Professor Blaganrov, at Cape Canaveral, Florida :

" . . . and it is a fight against many things. Against time —for this must be done within 23 days—against nature itself, which has now shown us that men are still puny in the eyes of the universe ; and against the very limitations of man's body and brain.

" For not only must the rocket be prepared in time, but also the boy who is to take it out there. Krushenko and Lophakov underwent twenty months of physical and psychological training for the stresses of space flight, apart from their technical briefing. The boy has twenty days to prepare.

" About the alterations to the rocket, I do not yet know enough. About this boy, Peter Oldcastle : I have met him, and thanked him, and have only this to say, that I—I wish he were my son."

*Interviewer* : How do you reckon the chances, Professor ?

" You realise that Krushenko and Lophakov are almost certainly listening. No matter. They would expect me to give you truth. Indeed, if you will forgive me, I will address myself to them."

*Interviewer* : Do just that, Professor. This is what the world wants to hear, but keep it in English.

" They speak English perhaps better than I speak American. Georgi, Dmitri : What the Americans have is a three-stage military space missile, designed to intercept our orbit if we had tried to put up a permanent manned station at 1,500 miles—which for some reason they expected.

" You will see immediately the possibilities—at least, you will, Georgi. With redesigned directional controls in the second stage, the third stage could theoretically match your speed in stable circular orbit at 600 miles.

" But the calculations to match direction and speed in an elliptical orbit ranging between 600 and 900 miles, starting from a different point on the earth's surface, are of an incredible complexity.

" And you realise that this third stage must now be a self-contained manned satellite, with all the problems that represents in manufacture from scratch.

" And you know better than anyone else what it will mean to pilot that stage, to get near enough to transfer fuel . . ."

*Interviewer* : Sorry, Professor, but could we have an answer to that question—about their chances ?

" Very well. By this time, they will have worked out what I was trying to tell them. Two days ago I said that only a miracle could save them—*infinity* to one—for I do not believe in miracles. But that was an emotional outburst for an atheist like myself.

" I am a mathematician by training, and now I know of the other factors involved—with human faith and courage and the wonderful spirit of all who are working here at Cape Canaveral among those factors—then I say that their chance is, perhaps, one in two hundred."

*Interviewer* : Faith and spirit—rather strange words for an atheist, Professor ?

" I have no more to say."

10.15 *p.m., October* 15, 1959 : *B.B.C. monitoring station, Tatsfield : Part-transcript of message in English from Russian Satellite* :

" . . . we listen to this British Goon-show thing, and that literary-Moscow-academician-to-be Georgi Krushenko, starts lecturing me in his very best English about the origins of English lunacy with Lewis Carroll and Edward Lear.

" This I might bear if Georgi would get back into our one and only space suit and pull down the helmet so I could not hear him. My command of the language, and the literature, is as good as his.

" Georgi says I must now be serious, since the English-speaking world will be listening. But since his face is upside down—to me—as he says this, it is not easy to take him seriously.

" He wants me to tell Professor Blanganrov that we have worked out the chances for ourselves ; to say to everybody it is a rotten bet but thanks for trying ; and to tell Peter Oldcastle, as he takes conditioning for space, you have to go through hell to see the stars bright and clear.

" And Georgi wants me to tell his girl in Moscow . . ."

(H. L. Smith, duty stenotyper, Tatsfield : *At this point transmission became garbled as though physical restraint was being used on speaker. Transmission resumed*).

" Georgi Krushenko speaking. Dmitri isn't well. He was going to say that we would like a two-way hook-up with Peter Oldcastle to discuss take-off and free-fall conditions, when this can be arranged. Closing now until next observational transmission in two hours.

*Digest of U.S. newspaper headlines, October* 16, 1959 :

WORLD HEARS SPACE DRAMA . . . FRANCE, ITALY SEND FOR TECHS . . . ELECTRONIC BRAIN EXPERTS RUSHED TO CAPE CANAVERAL : LINES TO COMPUTERS KEPT OPEN DAY, NIGHT . . .CAN SPACE-CAN MAKE IT FROM CAPE-CAN ? . . . GEORGI, DMITRI KEEP UP SPACE-PATTER . . . PULEEESE, GEORGI, WHO'S THE DAME ? . . . SPACEMEN OFFER KNOW-HOW TO RESCUER, WARN: IT'S HELL, PAL.

*From exclusive* Daily Herald *interview with Dr. Abner Oldcastle, October* 17, 1959 :

" Peter, as you know, is now at the School of Space Medicine in Washington. I didn't go with him because I'm needed here, at the Cape, to help give him a good *mechanical* chance of survival.

" The physical and mental side—that's up to him and the medical men at the School. If he breaks down, then we are wasting our time."

Doctor Oldcastle, blunt West Riding family man—he has an elder son of 18 and a daughter of 14—added : " Those young Russians seem to be using oxygen much faster than was allowed for.

" Now they reckon they can live another nineteen days. I hope so. I hope they don't die before my son gets up there—and I hope he doesn't die on the way."

*Stenotype recording of conversation in centrifuge pit, School of Space Medicine* :

*Dr. Manning* : Now we're going to start swinging you around at nine gravities—which means you'll weigh nine times your normal weight. Keep talking as long as you can.

*Peter Oldcastle* : It's becoming—a little difficult—to breathe—like an elephant on my chest—can't swallow now—can't close my mouth—eyes pushing into my brain—oh ! God, can't brea-aah . . .

*Dr. Manning* : Slow 'er down. He's out. Hey, Pete, can you hear me, boy ?

*Peter Oldcastle* : . . . fashtest roundabout in world . . . tryin' t'squash me flat . . . Hey, are you trying to kill me ?

*Dr. Manning* : If we don't try to kill you, Pete, then space will. You recovered quicker than anyone else we've had on this super-carousel. Now we'll give you a taste of what it feels like when the second stage blasts clear . . .

*Tape recording of conversation in explosive-decompression chamber, School of Space Medicine* :

*Dr. Manning* : Now you know the drill. This is how you'll feel if your shell—space-suit or satellite—is holed in outer space, and your air squirts into the vacuum. You must stay conscious long enough to slap a patch over it. That button on the wall represents the hole. Reach it, press it—or die. GO !

*Peter Oldcastle* : But I -aaarghh ! . . . Phew ! That felt like someone was pumping me up like a balloon. I nearly burst.

*Dr. Manning* : That's a genuine vacuum operating in there, Pete. Next time make it faster.

*October* 25, 1959 : *B.B.C. monitoring station, Tatsfield* : *transcription of message from Russian Satellite* :

" After our talk with Peter Oldcastle, and hearing what he is going through for us, we know it is not merely a matter of having things in common with him and other young people of the West, but of being essentially the same *sort* of people.

" Young people with their eyes on the stars . . .

" Our air is beginning to taste a little stale . . ."

*October* 26, 1959 : *Extract from* Daily Herald *leader* :

" . . . even if this attempt fails, it will take a major place in the history of mankind. For it marks the point where all the nations were truly united for the first time with a common goal and a common prayer : the safety of three young earthmen.

" EARTHMEN . . . a title that steps out of the pages of science fiction into the realm of everyday pride and hope . . ."

OCTOBER 28, 1959 : WASHINGTON : RESCUE TAKE-OFF DATE SET. CAPE CANAVERAL, FLORIDA, OCTOBER 28, 1957, AP : COLONEL MACK HOUSTON HEADING INTERNATIONAL " PROJECT RESCUE," ANNOUNCED BLAST-OFF WOULD BE NOON EASTERN STANDARD TIME (6 P.M. G.M.T.), NOVEMBER 5.

*Headlines in next day's British newspapers* :

PLEASE TO REMEMBER THIS FIFTH DAY OF NOVEMBER . . . MERCY ROCKET TAKES OFF GUY FAWKES DAY . . . ROCKET BID ON " THE FIFTH ' . . . ."

From feature article, Daily Herald :

" . . . But whether Peter Oldcastle succeeds or fails, "The Fifth " will take on a different meaning to future generations of British schoolboys. Fireworks Night will now be a celebration of one of the brightest and bravest episodes in human history."

*Stenotype record from press and radio conference, Cape Canaveral, Colonel Mack Houston speaking* :

" . . . No, goddamit, gentlemen, of course we're not ready. How in hell could you expect anyone less than supermen to design, fabricate, test, fit and equip what amounts to a manned satellite in three weeks flat ? It can't be done."

" But you've done it ?"

" Yeah, we've done it—but you should see the load of Rube Goldberg junk we've had to stick together with bailing-wire and chewing-gum.

" Ready ? No. But one of those guys up there has got to be in good enough shape to get outside his satellite in a space-suit and help Pete Oldcastle with the fuel transfer.

" If we wait any longer, they'll be too weak."

" Your description of the 'junk' doesn't sound too encouraging for the man who's got to ride it."

" Pete knows the score. You tell 'em, kid."

*Peter Oldcastle* : " The Colonel's a bit of a pessimist, you know. The engineers have done wonders. It won't be very comfortable, of course. I shall be in a spacesuit the whole time."

" How long ?"

" Twelve hours. That's the limit of my oxygen supply. I can't carry more, or take a regenerator, because of weight limitation.

" The computermen think they can get me within ten miles of the Russian satellite, in matched speed and orbit—which at 18,000-odd miles an hour and 700 miles up will be pretty marvellous shooting.

" Then I must manoeuvre up to Georgi and Dmitri with short bursts from directional rockets, make the transfer and break my own orbit within four hours."

" Why four hours ?"

" Because it takes longer to get down than get up. Come down too fast and you burn up like a meteorite."

" Exactly how will you land, and where ?"

*Colonel Houston* : " Okay, gentlemen, that's enough. Break it up now. The kid's gotta get in plenty of sleep."

*October* 28, 1959 : *B.B.C. monitoring station, Tatsfield* : *Transcript of non-routine broadcast from Russian manned satellite* :

" . . . and we have forgotten what normal sleep is like—for there is no day and no night, and lying down is no different from standing up. Drugs help a little. Georgi has taken a minimum dose of nebutal and is dozing now, strapped to his acceleration-couch with elastic webbing to give an illusion of weight.

" Georgi will be going outside for the fuel transfer. He has had more experience in the suit than me—and, of course, he is also bigger, older and uglier than me, so he argued me down.

" We have patched the nitrazine tank and think it will hold . . .

" We are both going a bit grey at the temples—probably the effect of radiation . . .

" The air seems as thick as *borscht*, but still breatheable . . .

" The earth is green and silver and white, and so beautiful . . . But at this moment I would prefer a closer view . . ."

*November* 5, 1959. *Extracts from final briefing* : " *Project Rescue* " *Base Control Room, Cape Canaveral,* 11.30 *a.m. Present* : *Colonel Houston, Dr. Oldcastle, Professor Blaganrov, Peter Oldcastle.*

*Houston* : " . . . nine g's first stage, eight g's second. You may blackout. But the servomechs take care of everything up to orbit. Six minutes. Then you're on your own—except that the whole world will be rooting for you. Best of luck, kid."

*Oldcastle* : " Happy landing, Peter."

*Blaganrov* : " May I just shake hands . . ."

*Extract from world network radio transmissions* :

" Five minutes to the count-down. Take-off must be at 11.53 point 5 seconds. Hundreds of thousands of people are watching from the sand-dunes for miles around and from countless small boats dotting the sea. And the world is listening, in every language under the sun—and moon.

" Immediately after blast-off, complete silence will be observed by all earth radio stations. The next voices you hear —we hope—will be from space : three-way transmissions from Peter Oldcastle to the Russians, and from the three-space-men to earth. We shall be eavesdropping on history . . .

" Count-down in two minutes, plus . . .

" One minute . . . Colonel Houston fingers the firing button.

" Thirty seconds . . . here comes the count-down. I'll give it to you : twelve, eleven, ten, nine, eight, seven, six, five, four, three, two, one, ZERO !

" And there she goes, on a pillar of white fire, shaking the earth with the roar of a million devils—or should it be angels?"

*Transcript from recording made at Cape Canaveral* :

*Oldcastle to Base* : She made it, Colonel ! The Junkpile made it, and I'm still in one piece . . . Using directional rocket to stop spin . . . Can see Russian satellite like fleck of silver . . . Calling satellite . . . Oldcastle calling satellite.

*Satellite to Oldcastle* : Dmitri here, Peter. Welcome to space. Hope you are keeping your dinner down. We make it about 13 miles. Wonderful."

" I'll be right over . . . Now I see what you mean about no up or down . . . Can't *feel* where you are, overhead or underneath, but so long as I can keep a sight. This is a bit ticklish : one squirt too much with this rocket and we'll be in different orbits. Is Georgi ready ?"

" All suited up and waiting . . . Five miles now . . . Easy, friend, Peter."

" Easy as she goes . . . I have only thirty feet of fuel pipe, so we must be within twenty feet to allow slack for manoeuvre."

" It's enough . . . enough to skip rings round the moon with . . . Here you come . . . Two hundred yards."

*Oldcastle to Base* : Now about to open lock and leave rocket with fuel pipe. My safety-line is secured. Georgi is clinging to satellite. He has rigged himself a safety-line with wire.

" This is the toughest part. Two young men on the flying trapeze—and we daren't miss each other. Ceasing transmission now. Dmitri will take over."

*Dmitri Lopakhov to Earth* : Peter has climbed out, is holding space-lock door. No, No !—don't let go until you are facing right !—I forget, he cannot hear me—he jumps. Too hard ! He will overshoot us ! No, Georgi has leaped, too, and clasped him by the waist . . . Now they have swung beyond my view. Georgi's leap caused the satellite to turn . . .

" They are coming into view again. Now they are together, two figures dark against the stars. They are touching their right-hand gauntlets together.

" They are—they are shaking hands . . .

" Now they are bringing over the fuel line. I can hear them making the connection. Now our satellite will have life again —and so shall we."

CAPE CANAVERAL, NOVEMBER 5, 1958, REUTER : A WORLD RADAR NETWORK IS TRACKING COURSES OF RESCUE ROCKET AND SATELLITE AS THEY SWING LOWER IN BRAKING ORBITS THROUGH ATMOSPHERE.

COLONEL HOUSTON SAYS : " GOD KNOWS WHERE EITHER WILL LAND." AIR FORCES OF ALL NATIONS ARE STANDING BY TO RUSH AID. BOTH OLDCASTLE AND RUSSIANS REPORT FRICTION HEAT GROWING.

NEW YORK, NOVEMBER 5, 1958, AP : WITH PARACHUTE VANES EXTENDED OLDCASTLE'S ROCKET SKIMMED TO HALT IN ATLANTIC

FIVE MILES OFF CAPE COD. COASTGUARD VESSEL PICKED UP OLDCASTLE FLOATING IN SPACESUIT. FIRST WORDS : " IT'S NICE AND COOL IN SEA AFTER THAT OVEN."

*Extract from front-page story*, Daily Herald, *November* 6, 1957 :

" . . . reported to have said when he stepped out : ' Is this Mars.'

" And Dmitri Lophakov said : " We *would* choose a place like the Sahara to land in after being nearly baked alive. But even this sand feels good."

*Extract from world radio, T.V. address by President of the United Nations, November* 10, 1959 :

" . . . and this morning, I am proud to announce, the United Nations Space Research Project officially came into being. Because of three brave young men mankind now stands together to challenge the stars."

*Peter Phillips*

## This Month's Cover

To date, very little information is available concerning the methods used by Russian scientists in placing their satellites in orbit. By a happy coincidence, artist Terry recently saw some Russian technical films in which the method he has depicted on our front cover *was actually being used* to assist rocket take-off from high altitudes. In this instance, the giant 8-rocket plane (very similar to Russia's new 220-seater passenger ship) drops away at a predetermined height as the motors in stage three of the main rocket take over.

It may well be that this was the system used to place Sputnik's One and Two in orbit. Similarly, it could well be the manner in which the first manned satellite will also be placed in orbit — in the not too distant future, concerning which Peter Phillips' story conveys a very fine authentic background.

*The books of Charles Fort—who was an insatiable collector of inexplicable happenings—are filled with intriguing events which could easily have stemmed from contact with another dimension or involved a warping of Time itself. John Brunner makes increasing use of these possibilities as his story fluctuates between the seventeenth and twenty-sixth centuries.*

# THRESHOLD OF ETERNITY

## By John Brunner

**Part Two of Three Parts**

### FOREWORD

Red Hawkins, sculptor in metal and stone, is standing at the gateway of his isolated Californian home one moonlit evening trying to ease the ache in his thigh caused by the aluminium leg he wears, when a dazzling flash of light partially blinds him. As his sight returns he is startled to find a badly frightened girl and an unconscious man in the roadway which had previously been empty. Even more alarming is the fact that the girl, Chantal Vareze, insists that she is in London, where she is a nurse. By some inexplicable happening, she has been transported six thousand miles in a few seconds but of the injured man she knows nothing.

As Chantal renders first aid, the injured man recovers consciousness and speaks to them at first in a strange sing-song language, but finally in a form of English they can understand. He tells them that his name is Burma and that he comes from a distant future-Time where it is essential for

him to return because the human race is losing a war. With a badly broken arm and a rising fever in his body he urgently needs their assistance. Red is so incredulous that he refuses to help but Burma imposes a mental command upon him, causing him to lift a peculiar metal cylinder. As he does so the cylinder glows brightly and the three of them are warped out of 1957 into another Time.

In another part of space and time, Magwareet, Captain of an anchor team in the year 4070, is involved in the temporal surge which lost Burma and many other highly trained specialists. In this time-period the human race are fighting a losing battle against an undefined enemy which is complicated by the presence at a number of points in the structure of the Universe by a Being of four dimensions. Warps in the Time continuum are breaking further and further back in history as the Being is affected by three-dimensional power surges from the opposing forces.

A city-ship from Lyrae 129 enters Magwareet's section of space apparently out of control and when it is possible for them to enter the englobed structure he takes a team of investigators to try and trace the cause of the disaster. They eventually find that one of the enemy has managed to penetrate the city-ship's screens and annihilated the inhabitants. In the resultant struggle they wound it and drive it underground where it is eventually captured. Magwareet reports back to Artesha Wong their chief Co-ordinator and learns that Burma has returned.

Red and Chantal together with the injured Burma had found themselves on a future Earth-line where they are rescued by some of Burma's colleagues and taken to Centre, the co-ordinating section where Earth's battles in Time are planned. Burma has promised them that if it is at all possible they will be returned to 1957. In the meantime they are taken to meet Artesha and Magwareet who have been conferring as to the best methods of tackling both the Enemy and the temporal surges being caused by the Being.

Red and Chantal are staggered to find that Artesha is in fact the electronic brain of Centre, but that once she had been Burma's wife who was badly injured in an Enemy attack. Because she was so important they had made a record of her mind and installed it into the circuits of their headquarters.

Artesha explains that both Red and Chantal are going to be necessary to them if they are to be successful against the Enemy, but meanwhile it is essential for them to find Wymarin, a scientist who has been working on a theory of communicating with the Being—it seems certain that he has been thrown back somewhere in Time during the last great temporal surge.

Magwareet decides to get together an anchor team to go back and find Wymarin, taking Red and Chantal with him. Before they leave both are taught universal Speech, the language of the twenty-sixth century, and Red's prosthetic leg is replaced by a living one of flesh and blood matched scientifically from his good limb.

As Magwareet's anchor team approach the temporal surge indicated on the Time map where Wymarin is thought to have disappeared they find their ship confronted by a gigantic Enemy spaceship heading for them at top speed.

## VIII

*Andrevas, High Priest of the most esoteric circle of magicians around the Imperial Presence in the Croceraunian Empire: It is not seemly for any magician to appear awed by a perfectly normal miracle.*

*Ezekiel, prophet of the Most High among the people of Israel: Under the firmament were their wings straight . . . every one had two, which covered on this side, and every one had two, which covered on that side, their bodies. And when they went, I heard the noise of their wings, like the noise of great waters.*

*Commander of an Italian air force squadron, North Africa,* 1941: *Four Savoia-Marchetti biplanes failed to return from reconnaissance flight . . .*

Magwareet hardly changed externally, but his relaxed attitude tensed indefinably. There was a short pause.

"I see him now," he answered. There was nothing but a smear of red on the illuminated plate he was staring at. "Arafan, what's his course like?"

"If he carries on as he is," the pilot reported unemotionally, "he'll sink right into this end of the temporal surge."

"Artesha, we'll have to get something after him—catch him! We daren't have an Enemy raider loose in the twentieth century!"

" Agreed." Artesha's voice was unhumanly level. " Magwareet, step up your generators to maximum. I want as much trace instability as possible on the maps. I'll have a squadron of ships after you as fast as possible."

" Right." Magwareet moved across the room in one easy bound, and his hands began to move like water rippling on a bank of controls. Arafan tensed, watching the viewplate.

" There he goes !" he said, and pushed a lever home.

This time the confusion and sense of change was redoubled. Red was aware of Chantal grasping his hand and trembling, but she appeared blurred, and he was able to feel her both now and an instant ago, as if memories were co-existing in the present.

" Is this—the first time anything like this has happened?" Chantal asked, and Magwareet replied without turning.

" Yes. As far as I know, the Enemy has never before struck the end of a temporal surge. It's not surprising—they all peak within the Solar System, and few of the Enemy get so far . . ."

He glanced at Arafan's viewplate. " Anything following us ?"

" Can't tell ! We're co-existing with the anchor team Burma was with, now. It'll be impossible to sort out anything else till either we or they drop into normal space again."

" Then there's nothing else we can do," Magwareet said. He turned on his heel and stared at Red and Chantal. " I suppose you want to be told what's happening. Well, somewhere ' behind ' us there ought to be enough ships to take that Enemy raider apart. But—it's difficult to make it clear—roughly, things go through a temporal surge in the order they enter it in real time, and original relationships are preserved. I think by your time it had been discovered that there are things called operators—actions which have equal reality with the things they affect. Our relationship with the Enemy is unchanged because the operator which has been applied to us—the temporal surge—acts only *along* the world-line, and not across it."

He shrugged. " So until we return to normal space, we don't know what's happening to us, or the Enemy, or the ships following us. What's worse, there has never been a chase like this before. "

" Why can't the ships following do what we did—enter the surge at the same moment as us ? You can jump in time—"

"That jump gives a surplus of temporal energy, which is what we use to detect something out of its original time. The more you have, the slower you pass through the surge. The Enemy has none except what it's getting now; we have twenty hours' worth and we can't tell how much the ships behind us have because we don't know how far they had to jump in time to enter the surge."

"Anchor team's splitting!" reported Arafan.

"What?"

"They've hit a sort of eddy! It's tossed some of them back into normal space . . ."

"When the fleet gets here, we'll have to pick up anyone we can." Magwareet brightened. "Maybe Wymarin or one of his staff will be among them!"

"We're going to emerge," warned Arafan. "*And there's the Enemy*!"

It was beyond imagining vast. It lay across the Milky Way like a black rod, and it was like no ship Red and Chantal had ever imagined. It was pentagonal in section, and the ends of its long shaft were multi-faceted lenses gleaming with cold fire.

"Do you imagine they know where—when they are?" Chantal breathed.

Magwareet shot her a glance and spoke dryly. "It took us years to figure out about the Being. If they've solved the problem this soon, they're cleverer than we are."

The Enemy raider rolled—so slowly, it seemed. As it turned, something that glinted rushed across the sky—out of control.

"That must be one of the anchor team's ships!" said Magwareet. "Will they—?"

There was no sign from the Enemy except that one facet of one jewelled end blazed like a sun, but the racing ship became a Catherine wheel of incandescence and bloomed into a flower of yellow fire.

"If Wymarin was aboard—!" said Magwareet, biting his lip. Arafan leaned forward, turning to the viewport as if to confirm what his instruments reported.

"They know *where* they are, at any rate," he said. "Look!"

Again the huge ship was turning, this time so that its axis lay along a line that intersected a tiny blue-green disc in the

sky. Red realised in sick horror what it must be, even as Chantal uttered the words.

"Red, surely—that's Earth!"

A thousand fantasies filled their minds. Were they back in their own time? If so, then they themselves before they met each other were walking about on that tiny planet. If the Enemy struck—if it did damage—what would result?

Incoherently Red asked the question. Magwareet snapped at Arafan, "Go after them!" and wiped his forehead. "I don't know," he confessed to Red. "We think that our interference with the past is already accounted for, but we have never had outside intrusion before. And there's the fact that we can't detect what happens in the past as the result of a temporal surge until it's peaked in real time. We couldn't tell that Burma's anchor team was going to be scattered into history, because if we had known we'd have prevented it and it wouldn't have happened . . . But this is unique. Where the hell are those *ships*?"

The minute disc that was Earth grew larger. He came to a decision. "Arafan, we'll have to decoy them. Why didn't I have this ship armed? Oh, what a mess!"

Red had been wondering why they themselves had not shared the fate of the anchor team's ship. He had his answer in Magwareet's next remark.

"Are you screening out everything, Arafan?"

The pilot nodded.

"Can you drop the screens so that they catch sight of us and get them back up before they can fire on us?"

"No," said Arafan.

"I suppose not . . ." Magwareet went to the viewport and leaned against it on his outstretched arms, palms flat. He stared at the Enemy, as if working a complex calculation.

"Arafan, that ship has a blind spot. It's a belt round the middle of the shaft. The facets only radiate at right angles to their plane surface, don't they? They can't fire on anything subtending an angle smaller than—oh, about nine and a quarter degrees is my guess—to the two ends. Could you get that close?"

"We'd have to creep up," the pilot answered. "I'm not sure our screens would mask the drive energy at short range. Want me to try?"

"We've *got* to try !" said Magwareet. "Where are those *ships* ?"

Arafan's face was quite composed as he turned the ship. The Enemy grew abruptly larger, until it almost filled the viewport, its faceted ends just touching the edges of the transparent plastic. Then he shut off the power, and they began to drift towards the mid-point of the vast pentagonal shaft.

"Can't they—see us ?" said Chantal, her voice trembling.

"No. We've proved their detectors can't register our screens." Magwareet seemed suddenly to recollect who they were, and spoke with gentleness. "Wouldn't you rather be below—out of sight ? This must be very upsetting for you."

Red felt more terrified than he had ever been before. His guts felt as though they were tied in knots and were being pulled tighter as minutes seeped away.

He hesitated, but Chantal answered with firmness. "No. If we didn't know what was going on, it might be all right. But just waiting, and not being able to see anything—it would be unbearable."

Magwareet nodded, and eyed Red. After a moment more thought, the latter signified agreement also, and together they turned to watch the flat side of the Enemy grow and grow . . .

The tension climbed steadily towards the intolerable. Red felt he must scream in another second, or hide his eyes, or—best of all—run. Somewhere. Anywhere.

Chantal, when he stole a look at her, was gazing through the port with fascination, as if hypnotised. Arafan had somehow managed to lose himself in the symbols on his instruments and forget the reality, but Magwareet knew he was risking their lives on guesswork, and even though he had been trained for years to guess, and guess right, he still suffered that terrifying fear of being mistaken.

"Arafan," he said softly. The pilot inclined his head. "When I say *now* ! drop the screens. Wait a moment. Let them get a good sight of us. Then raise the screens again and head directly outwards."

Arafan's head swung round as if jerked by a rope. "Are you crazy, Magwareet ? Straight into the full blast of their armament ?"

"Do as I say ! All right—now !"

And an indefinable mist cleared from the viewport, so that they saw the Enemy apparently close enough to touch.

"They're nearly within range of Earth," Red heard Arafan say in that long moment when they lay naked and defenceless. Magwareet gazed at the broad expanse of metal, thinking of the big, five-limbed creatures inhabiting it.

*They came from a planet with a sun, surely*, he thought. *They breathe air, as we do, and they must eat food and reproduce . . . What shuts them off from us? Why would they lay waste that world down there?*

He grew aware that they had been dangerously long here. "Arafan!" he rapped. "Screens up! Head outwards!"

The pilot's face had gone completely white. His hand reached out towards a control lever, and remained, shaking like a leaf, inches from it.

"I—I daren't do it," he moaned.

Red glanced at the side of the Enemy ship, and saw with blank despair that it had already begun to change position and bring them within the field of fire of its weapons. If that sun-like power struck them when the screens were down—!

Magwareet waited the instant necessary to think out and co-ordinate all his movements. Then he leapt across the room and slammed into the control board, falling on to it as on to a floor, face down. His head struck the screen control, one hand found the power and the other the course director. He was barely in time.

The viewport was suddenly blinding with red light, and a shrill alarm rattled at the edge of hearing. Fatalistically, they waited for disaster. All except Magwareet, who had slumped to the floor with blood crawling down his face.

Arafan recovered slowly and rose to his feet, looking at the injured Magwareet with awe. "I should have known better than to distrust a co-ordinator," he said.

"Why? What's happening?" Red and Chantal spoke together.

"The radiation pressure is pushing us back! There's power equivalent to a small star driving against us. In a moment, we'll be able to start our own engines and get out of harm's way." He dropped back into the pilot's seat.

Sure enough, after another few seconds the red against the port faded and vanished, and the Enemy was no more than a stroke against the stars.

Magwareet stirred and picked himself up. Chantal ran to help him, but he shook his head when she asked if he was badly hurt. He looked meaningfully at Arafan, who bent his head in acknowedgement, and then, wiping blood from the cut on his head, turned to the port.

" Here they come !" he said with infinite relief.

Like a chequerboard of multiple suns the ships of Earth sprang into being. They caught their breath at the sight. There were hundreds of them, and they brought an overwhelming impression of power. It was very comforting. But it seemed they had no more than appeared when they returned into nothing.

" What— ?" began Red.

Again the Enemy had turned, and now it was clear that the blue-green disc aligned with it was really a round planet rolling about the sun. Its polyfaceted end looked like the eye of an evil insect focussed on its prey.

A transient flicker illumined the interior of the eye.

And the defending ships were back. But this time they were like novae erupting, and the Enemy glowed.

It shone like a red-hot wire, except for its ends, which almost instantly began to swing again, but more swiftly, while each of their facets became a piece of a star. One of the novae flared up and winked out.

But the glow whitened.

The lensed ends became uniform masses of intolerable light, and Red noticed with a start that the viewport had darkened until the stars were no longer visible—only the greater-than-sunpower of the fighting ships.

A dozen of the circling attackers passed into nothing, and there was a shift which altered their arrangement. But they had also closed in.

" How come they are destroyed so far away when we took all they could give us at close range ?" Red wanted to know.

Magwareet answered absently. " We have a lot of delicate equipment on board. The energies in a temporal surge wipe clean the electronic patterns in computer memories unless the insulation is very good indeed. So we're carrying at least twice as much screening as any of those ships out there."

The circling novae were definitely fewer now. Some twenty or thirty of them must have been seared into nothing by the

mighty alien. Their pattern changed again. Red felt Chantal shiver as she stood close to him.

Unexpectedly Magwareet uttered a jubilant cry. " We've got them !"

Almost imperceptibly the balance had shifted, and the central shaft of the Enemy ship was now noticeably brighter than its ends. At the same time a bluish tinge crept into the luminance.

" What do you mean ? "

" They're having to switch their available power from attack to defence. Once they do that, it's only a matter of time."

The blueness spread steadily until it covered even the ends of the Enemy. Blazing, the attackers moved in for the kill.

Finally, the blue light began to shift back down the spectrum becoming yellower, and at last taking on a hint of red. Last of all, it sank beyond the visible, and the remnants of the mighty ship turned into a cloud of dust.

There was complete silence in the room.

" Won't they have seen that back on Earth ?" Chantal said eventually, and Magwareet shook his head.

" There was a ship standing by between us and Earth doing nothing but shift radiant energy up the scale and cover it into high energy particles. All Earth will have detected is a slight increase in cosmic rays." He went across the cabin, muttering, " Excuse me."

There was a blank plate set in the wall, with press-buttons under it. He punched one of them and said, " Commanding officer, please."

The plate lit to show a fat woman in a coverall soaked with sweat until it clung to her like a second skin. She gave Magwareet a wry smile.

" Think I'm the senior surviving officer. That was a hell of a ship, co-ordinator. Must be their biggest and latest design !"

" It could be. I want you to give a detailed report to Artesha on your return. I also want your ships—when they re-enter the temporal surge—to look out for the other peak we passed shortly before emerging. There's an eddy close to it, and some of the anchor team Burma got lost with have been thrown out into normal space nearby. Check on them and if Wymarin or one of his assistants is among them, let me know. Okay ? "

" Agreed," said the fat woman. She gave another wan smile, said, " A hell of a fight !" and disappeared.

" It was indeed," said Magwareet to the air. " I hope I never have a closer call. Well, I wonder what the detector teams have come up with. You might as well come down with me, Red and Chantal."

" There *are* other people on board ?" Red said haltingly.

" Eight of them."

" Did they know what was going on ?"

" No . . . They were studying temporal maps, so they'll have registered the appearance of the Enemy raider and of the fleet, but they don't have details. This way."

The room was directly beneath the pilot's cabin ; its walls were lined with green-glowing time maps. Five women and three men listened quietly as Magwareet recounted the history of the past few minutes, but made no comment. Red remembered that there were people fighting for existence, who had been schooled out of wasting their time.

" Found anything ? " Magwareet asked when he had finished.

" Here," said a girl with dark hair, and pointed. " This is anachronistic, but it's an exchange with the close peak where the anchor team was broken up. See ?"

" Oh no," said Magwareet slowly, studying the green pattern. " Yes, it's right in this moment, isn't it ?"

" Is it bad ?" Red put in tentatively.

" It may be. It may be very bad. For some reason we can't fathom, anything picked up in a temporal surge is more likely to be organic than inorganic, and most likely to be human. The mass of this one is small, but diffuse—which means several people or animals. And if they're people—"

" What ? "

" Then 1957 has been invaded by a bunch of the most bloodthirsty savages in history—a war party from the twenty-third century Croceraunian Empire."

## IX

*In the middle of the eighteenth century the foundations of Lisbon fell apart, and with them the foundations of absolutist religion.*

*In April* 1906 *the same thing happened to the city of San Francisco. Some people said it was just that a negro badman*

*called Stackolee pulled all the waterpipes loose ; more logically, it seemed that a lump of the world had vanished from below.*

*In* 1908 *something gigantic fell in Siberia ; long, long before, something vastly larger had fallen in Arizona. Of course, there was no reason to connect these things . . .*

Chasnik, commander of the war party, would have been perfectly invisible to anyone in the Dead Place at the foot of the hill. But it was said that there were still people in some of the ruined cities who knew the magic of the Old Days, and Chasnik had a powerful respect for magic of the kind which had produced the prismatic binocular periscope through which he was surveying the scene. Therefore he kept as much of the rock between him and the Dead Place as possible.

The Fist of Heaven had been merciful here ; it had struck not the city itself but the low ground on the other side of the river. Probably the rush of air and the wildfire had done more damage than the actual blow. Some twenty or twenty-five of the towers were still standing.

A hint of movement at his side disturbed him, and he scowled down at the fresh-faced boy of nineteen who crouched there. Chasnik had not yet figured out exactly what he was going to do to the official who had ensured that he—he, Chasnik, fourteenth in the roster of raider captains of the Croceraunian Empire !—was sent out this time with a freshly graduated novice magician.

Still, he wore the symbols : there was power in the blue tattoos across his body and arms, and obviously someone thought highly of his ability.

Grudgingly, Chasnik stepped aside and let Vyko get at the eyepiece of the periscope. After a quick look, the boy nodded.

" Quiet enough," he said. " My bones don't show any risk in the near future, but—"

" But what ?" Chasnik demanded harshly. " There have been too many reports of miracles lately, Vyko ! I'm not going into any Dead Places, no matter how nearly intact they may seem, until I'm trebly sure of what I'm doing."

Vyko coloured slightly, but he answered boldly enough. " Do you not see this ?" he demanded, bunching his right fist and raising it towards Chasnik's face. " Do you not know the mark of the Eyes that See ? I tell you, Chasnik, that there is no danger in the immediate future for me or anyone who is with me."

Chasnik grumbled to himself ; he had never really liked the fact that it was not the commander of the party but the magician who could see ahead who made the plans.

" In fact," finished Vyko almost to himself, " I have never known the future seem so uneventful."

" Nonetheless, I wish to try it for myself," said Chasnik. " Crettan ! "

" Captain ?" A man slid down the side of the hill like a ghost.

" Cross the valley and breathe on the Dead Place with the Breath of Terror. That way we shall know if there is anyone with power there."

" Aye, captain," said Crettan. He didn't look pleased, and Chasnik eyed him sharply.

" Well, what is it ?"

" This Dead Place is largely undamaged," said Crettan haltingly. " I have heard that—suppose there are—suppose they strike me with the Fist of Heaven !"

" Blasphemy," said Vyko quietly, before Chasnik could reply. " The Fist of Heaven is not at the call of men. I shall require an hour of penance from you at camp-time tonight."

Crettan scowled and withdrew ; in a few minutes they saw, his horse, laden with the generator of the Breath of Terror slip away into the hills.

There was nothing to do now for a while but wait ; Chasnik whispered orders up the hillside, and the party of men relaxed into comfortable positions. Then he found himself a spot and was annoyed when Vyko dropped beside him.

" Sorry about that, Chasnik," said the magician informally. " This stuff is all very well for the men—I had to drive the point home—but it's a nuisance."

Chasnik could never get to enjoy the casual way in which Vyko, a beardless boy, assumed equality with him. He only grunted in reply, and, seeing that the captain was not in a talkative mood, Vyko bent to the periscope and studied the Dead Place.

His heart pounded. This was the first time he had come out as staff magician for a war party, though of course he had made a few trips as a novice. Furthermore, this was the first nearly intact Dead Place he had approached, and he longed to find out what those enigmatic ruins concealed.

Oh, there would be the obvious things, naturally—it was the war party's main purpose to discover and scout the sources of metal, plastic and other materials in such ruins. But Vyko, despite his education, despite his carefully nurtured ability to see the future, still wondered how right the stories were . . .

These people—of the Dead Places—had angered Heaven, so it was said, and been struck down for their arrogance. Their seed—himself and Crettan and Chasnik and the rest—had been scattered abroad. But there were books, a few, carefully preserved volumes, which hinted at something else. Vyko wanted to find more of those books.

He knew, for instance, because one of the old magicians at Court had told him, that there had formerly been a curse on the Dead Places, some fifty years or more ago. A man who entered one became sick, his hair dropped out, his teeth decayed, and after long suffering, he died. Yet now the war parties could venture into them without risk except from the few people who had survived in them, or had found out earlier about the lifting of the curse.

And then there were the stories from the very fringe of the Empire . . The Emperor, naturally, claimed dominion of the whole of this land mass ; in fact, his war parties were still scouting quite a lot of it after the Empire had been in existence over a century. And certain of the parties, who had been far to the east, had found people who still (still ? Without a break, or after rediscovery ?) wielded some of the power of the Old Days. They could not have been struck down by the Fist of Heaven, then ; they could not have been as arrogant as these men here.

And—of course—there were the flying things. Vyko had been present at the burning of one of them. It had been huge and silvery, and made a great noise as it came to earth, but before any sign had come from it, the senior officer present had given a slight nod, and the Breath of Terror had eaten it up. Occasionally, they were still seen, but they no longer landed if they could help it.

Birds—gigantic birds which had fed on the Dead Places until they became metallic and huge. That was all they could be.

An hour passed as the sun sidled towards the horizon. At last, from the other side of the Dead Place, the Breath of

Terror wafted gently across an acre of shattered brickwork and concrete. Vyko found himself hoping that there had been no valuable books in that part of the Dead Place.

"Now," said Chasnik eagerly. "Now we shall see."

They waited for a tense minute to see an answering weapon strike from one of the broken towers. Nothing happened. Nothing—

But there was no Dead Place.

There was a tract of cultivated land.

There was no rock sheltering them. They lay out, exposed, on a naked hillside.

In the valley, a machine was at work—if it was work, for it seemed to consist entirely of travelling back and forth, leaving the turned brown soil a dusty grey when it had passed. Even as they watched, a big black carriage that travelled at enormous speed with no draft animals went by on a brown track between the fields.

Chasnik's military training asserted itself; a few quick orders before anyone had time to think, and they were safe behind sparse cover. Then he looked round, seeing Vyko nearby.

"What can have happened?" Vyko said in wonder.

"That's a fine question for you to ask!" stormed Chasnik. "You're supposed to *know* all that."

From up the hill came a keening, as the men realised what had happened. Someone cried, "A miracle!" and Chasnik yelled at him to shut his mouth.

"Well?" he asked Vyko. "You said the future was uneventful. Now a sorcerer in that Dead Place has picked us up by magic and put us somewhere else. I call *that* an event." He was being heavily ironical to help control the nervousness he felt.

Vyko shook his head. "I don't think so," he answered. "Chasnik, I believe a great boon has been granted to us." His eyes shone. "I haven't yet got the feel of what is to come, except that it is great and terrible. But look yonder—did you ever see such a machine? There are men with it, too! And that black carriage—there's only one answer."

"That being—?"

"We are being granted a sight of the Old Days! We have been moved in time."

Fear showed in Chasnik's black eyes for a moment, but he answered roughly, "Magicians' jargon! Nonsense! I'll

accept a sorcerer can move men in space—I've heard of such things often enough—but in time . . . ! No, we must have been sent to one of those places to the east of the Empire where these men with strange powers live. And therefore we have a fine chance to add to the Empire ! "

*That'll teach them to send me out with a freshly qualified staff magician* ! he added to himself, and went on to picture the advance in status a whole new province of the Empire—especially one with so many secrets—would get him.

" It's something I've always dreamed of," Vyko went on, but Chasnik flung up a hand and almost started out from cover at what he saw.

Panicked—presumably—Crettan had again loosed the Breath of Terror, and the strange machine and its attendants had flared to nothing. The ground about it was charred.

" Idiot !" said Vyko softly. Crettan's racing horse now came into sight being ridden as if he was fleeing a thousand devils. " Oh, the idiot ! Chasnik, he will give away our position if he comes charging up that way."

Chasnik nodded. He glanced up automatically to note the position of the sun—which was bright in a cold clear sky—set the range of his gun to maximum, and aligned it on Crettan's body.

They were beautiful weapons, these, Chasnik thought, as the man and horse tumbled together in death. He did not understand quite how they operated—something about total conversion of incident illumination into beamed sonic frequencies capable of disrupting protein molecules was how the magicians referred to it. They were little use at night or on a cloudy day, of course, but for ordinary occasions, sighting one of them on a man's neck or skull was enough to dispose of him in a second.

Maybe—one day—they'd discover how to make them again.

" Conference !" said Chasnik shortly, and the section commanders slid down the hill towards him. There had been no further sound from the men, but Chasnik could tell well enough when there was tension sapping at morale.

" Sorcerers must have lived in that Dead Place," he began glancing at Vyko as if challenging him to contradict. " We seem to have been moved somewhere else by magic."

The NCO's stiffened and made as if to move closer together.

" However !" said Chasnik. " This has great possibilities!"

He went on to paint the rosy future awaiting men who added new ground to the Empire—skillfully, Vyko had to admit, so that soon enough this apparent disaster had become an apparent blessing.

Not entirely, though ; a few of the older NCO's looked thoughtfully at their young staff magician while Chasnik was speaking—wondering, perhaps, whether he was competent to protect them after they had been struck by this kind of magic.

" So we will range out until we discover a centre of population," Chasnik finished, " and base our further moves on what we discover there."

It was not done to mention ' centre of government '; no sensible official of the Croceraunian Empire referred to the existence of alternative rule.

It took them only minutes to assemble and move off ; Vyko rode thoughtfully at Chasnik's side as they made for the track leading through the fields.

For half an hour or so they progressed warily, seeing little sign of life. There was cultivated land all round them, but obviously either awaiting seeding or lying fallow. No one came until they had covered some miles.

Then a strange noise on the track ahead warned them of the approach of another of the carriages without draft animals. This one was going too fast for them; a hundred-man war party could not melt instantly into the landscape.

The car halted with a screech of brakes, and a scowling man looked from one of the rear windows, his mouth opening in astonishment at the sight of Chasnik's men. He called out.

" Why—he speaks almost our language !" remarked Vyko.

" Is that so peculiar ?" said Chasnik. Tension showed in his voice, and several of the men seemed to be drawing back from the apparent power the car represented.

Assuming a bold front, he rode forward to the car.

" Who are you ?" the scowling man demanded.

" Chasnik, fourteenth captain of the Croceraunian Empire," said Chasnik shortly. The man blinked.

" Show me your identification papers !"

" Men do not address an Imperial officer that way."

" Why, you—" The man started to get out of the car. Chasnik motioned, and at once a hundred men were visible, weapons poised and aimed towards the car.

" That's right," said Chasnik silkily. " You are plainly a man of some authority. You will get out and come with us."

Two soldiers advanced and took the scowling man roughly by the arms ; another dealt with the driver of the car. It was standard—and good !—policy to obtain a hostage as early as might be. It was a useful bargaining point.

" And the carriage ?" said Vyko wistfully.

" Destroy it." Chasnik signalled the man with the Breath of Terror, and the car flared up.

" You won't get away with this," the man panted. " I am important—I will be missed. There will be search parties, and when you are caught—"

" Just as I want it," Chasnik replied. " Camp down, men ! Full defensive circle. It's easier for them to come to us than for us to go to them."

With quiet efficiency the circle was made. In twenty minutes the war party commanded ten square miles of ground. Securely bound, the strangers were thrown to the ground in the middle of the ring.

But before the men could vanish under their improvised screens, there was a howling overhead and one of the flying things circled them three times. On the third pass Chasnik lost patience and ordered it fired on, at which it flew off.

" That will bring them !" said the captive sombrely. Vyko turned to him.

" You mean—there are *men* in those things ?"

The captive stared, and then laughed. Vyko tried to press him, but the man was not willing to answer, and when Chasnik saw what was happening, he forbade it.

The captive, though, was right. Barely an hour had passed when there were rumblings from up the valley, and a scout came in to report that wagons bearing troops were on the way. Chasnik nodded, and ordered fire to be held for the time being.

" Oh, but this can only be the Old Days !" said Vyko as he studied the transport arriving, the strangely armed men deploying into the landscape. Another aircraft swooped overhead ; Chasnik had not been counting on having to be invisible from the air as well as the ground, but he had done his best to rectify his earlier mistake.

" You're the expert on them !" said Chasnik bitingly. " Look yonder ! Does that not seem like an officer ?"

Vyko studied a trio of men who had emerged into plain sight and were walking in irregular echelon in their direction, weapons in hand. " It does," he agreed, meaning the leader.

" Go down and parley with them, then," said Chasnik.

For a horrible moment Vyko felt himself on the brink of a precipice. He recalled what was most likely to happen to anyone attempting a parley with Croceraunians. But then his strong urge to find out more of this wonderful age triumphed. If he only got a chance to ask some questions— !

With an almost happy smile at Chasnik, he rose into sight.

The trio ahead stiffened and halted. The officer was the first to regain himself after seeing Vyko's odd clothing, and the outlandish tattooing on his body. " Come forward without hurrying !" he directed.

Vyko did so, heart hammering. The others made no move until he was thirty feet from them, when the officer gestured. " All right, stop there. Who are you and where do you come from ?"

Vyko debated his answer for an instant. There was one possibility, of course : this man might understand some of the esoteric signs used by magicians, and see the necessity for talking away from Chasnik's suspicious eyes.

He started to make the sign demanding secret conference, but the trigger finger of the soldier on the officer's right was over-close to the firing pressure. An enormous fist seemed to slam Vyko in the stomach, and he dropped to the earth in a black haze.

Chasnik, watching, rapped the order to strike, and in a few moments the war party had all but wiped out their opponents.

Before the sun set, they were masters of the countryside as far as they could see, including two unsuspecting villages and several miles of metalled road.

" Now," said Chasnik with deep satisfaction, " we can argue properly ! "

## X

*Extract from paper read to the British Society, Physical Division, June 3rd, 1974 : " In place of the now exploded concept of the Conservation of Energy, it is proposed to substitute an equation defining the conditions proper to the displacement of energy from ' now ' . . . This suggests that what to us appears as the destruction or creation of matter and energy may simply be due to a sudden reversal of the entropy of wavicles over a sharply delineated area of the continuum . . . The path ' backwards ' through time as an anti-particle need not coincide with the ' forward ' one . . ."*

*It is highly improbable that King Cambyses had heard of any atomic theory, even the Democritan one, when his army with himself at its head marched into the unknown vastness of history, and was never heard of again.*

The arrangement of the half-dozen small ships aboard which an anchor team carried out its work was always haphazard, depending on the whim and convenience of the team's director. It did not much matter, since the Being's 'substance' was reasonably homogeneous over any given area.

Its presence could only be detected by the most sensitive instruments, though ; it registered on them more as a tendency to displacement in time than as anything more tangible.

As he pushed his way through the airlock of the nearest ship belonging to the team he had selected, Burma could not help wondering what kind of configuration the director had adopted this time. It was a good team—that was why he had picked it—but from the arrangement of the ships it looked as if they had simply been allowed to drift in a circular orbit until they were randomised.

It was good to have the familiar tools of his trade about him again, after his nightmare plunge into what he could not help thinking of as a barbarian era. It almost, but not quite, stopped him wishing that it had not been necessary to do away with sleep. The combination of hypnotic relaxation and selective removal of fatigue poisons which the race had been forced to develop doubled an individual's thinking time, was completely harmless and even aided longevity. But he missed —how he missed !—the ability simply to turn himself off for a while.

*We never knew*, his mind ran on idly—*we never knew just what a human being could be made to do until we* had *to find out. Yet—and still we're being* made *to do it—how long can we stand the strain* ?

He came into what should have been the busiest part of the ship, and stopped dead in his tracks.

Among the elaborate and immensely valuable set-up of equipment, there was one weary-looking woman of sixty monitoring a single input trace on the temporal band.

He spoke with a kind of controlled fury. " What—the hell —is going on ?"

The woman looked up and half spat at him. " So they finally remembered us ! Who are you ?"

Burma ignored that, and pursued, " This is supposed to be a fully operating anchor team ! Where is everyone ? What do you think you're doing ?"

Stung, the woman retorted, " Ask Artesha ! They put out a call yesterday for the top men in alien psychology to investigate this Enemy they captured, and every blasted member of this team was sent for except me !"

Burma forced himself to calm down, but he was still fuming. Mistakes like this were inevitable when you were trying to administer the fighting efforts of a race of some quintillion-odd individuals through a central agency. " All right," he said, and told her who he was. " I'll have this settled in quick time. Artesha !" he added, opening the communicator on the wall.

" I'm sorry," said Artesha when he had explained the situation. " I was getting around to that—I wanted to break up the team and disperse it because the odds are slightly in favour of us getting results with the Enemy before we get them with the Being. After all, we have more knowledge of their psychology—"

" We did have," corrected Burma. " Artesha, you aren't computing with the fact that Wymarin stimulated the Being —are you ? I have only the faintest idea how he managed it, but I know he was on to a brand new line. Listen !

" We've found only one way of directly affecting the Being before—that's by an atomic explosion. It doesn't like high energy levels. Maybe they affect it like a hot fire does a man. Anyway, we can't find traces of its presence much closer than Mercury to the sun, and every time there's a really big explosion it writhes.

" But Wymarin had an idea. He's been pushing the possibility of the thing being intelligent in a way comprehensible to us. Mostly, we've been assuming it's the four-dimensional equivalent of an amoeba, because it exhibits the same kind of actions and is equally shapeless so far as we can determine.

" He tried to *communicate* with it. He wanted to see if we could explain to it what it was doing to us, so that it would help us to move it out of this area of space. And if it was the result of his communicating with it that caused that last outsize temporal surge—the one that caught me—"

" I see," said Artesha. She sounded as nearly excited as she could get. " I can't return all your experts, but there

must be some who've completed their contribution to the study of the Enemy. Why did you pick that team, anyway?"

"Because there were experts in psychology here as well as in continuum mathematics," Burma answered. "The same reason you took them for the study of the Enemy."

"I'll have your people with you in quick time," Artesha said, and signed off.

Burma turned from the communicator to find the woman eying him. "I'm sorry," she said reluctantly. "I didn't know who you were. I'm Lalitha Benoni."

Burma acknowledged the introduction. "Had your team been attempting anything on the lines Wymarin tried?" he demanded.

"No. We were thinking in terms of the Being reacting to stimuli. Mainly, we were trying to set up a pattern which fitted the way it starts away from atomic explosions and such-like, in the hope of discovering a stimulus that would drive it away. Owing to the Being's four-dimensional nature, we assumed the prod would need to be pretty complex."

"I wish co-ordination wasn't so difficult!" said Burma feelingly. "We've got nine thousand-odd anchor teams all over the Solar System, and we haven't yet solved the problem of making the information obtained by one available to all immediately. When did you last check your digest computer?"

"Yesterday. I haven't had a red-tabbed signal in since, though." Lalitha spoke defensively.

"One of the mathematicians on another team worked out the end results of driving the Being away." Burma was surveying the equipment as he spoke; it seemed in good order. "It would literally wreck the Solar System. The sun would nova; the planets would leave their orbits—everything. But of course it wouldn't be red-tabbed, since this was probably the only team which really needed the information. So, it's as well the pattern has been broken. We'll be able to get down to our own problem with fresh minds."

He was referring to the fact that after one of the anchor teams—or indeed any of the groups of super-specialists who were the brain of the race working as a whole—had functioned smoothly together for some time, there grew up among them a mutual understanding which approached telepathy, which was wonderful so long as they remained on the same task, but which made it appallingly difficult to change their line of research.

" Put the digest computer on to sifting the data of the last year for items regarding communication with the Being," Burma added. Nodding, Lalitha did so. Burma began to hum to himself as he continued studying the machinery. It was good ; the former director of this team had been an imaginative man.

" What a hell of a waste !" he burst out suddenly. Lalitha made an inquiring noise, and he went on, " Sorry. Your team has done some fine work. I was just thinking it was a shame that driving the Being away should turn out to be too big a risk after all."

Lalitha nodded, and the digest computer burped its little 'ready' signal. " Already ?" said Burma, alarmed. " I expected there wouldn't be much on the subject, but if the computer got through the lot so quickly there can hardly be anything."

There was hardly anything—four completed preliminary studies, two of which he had helped Wymarin to programme for their own team's computers, and an unfinished simultaneous broadcast which had been recorded while Wymarin was actually carrying out his experiment.

" Oh, good man !" said Burma, seizing it. " This is like finding treasure ! "

The record was notated in the chicken-scratch markings of telemetered instrument readings but he could follow it without trouble. At the end, he frowned. " Tantalising !" he exclaimed. " Just when it starts to show a response, the temporal surge built up and its energies jammed the broadcast ! Lalitha, put a computer on to analysing the trend of these recordings, will you ? I can't see a predictable pattern, but it's worth trying, I suppose. Wymarin's such a brilliant intuitive reasoner, though, I suspect he would just have been relying on his subconscious to lead him on until he found something that worked."

There was a cough at the door and a man entered. He looked around before coming over. " Gevolan," he introduced himself. " Artesha told me you were starting something big here ?" The sentence ended in the faintest of inquiries.

" As soon as possible. How's the study of the Enemy ?"

Gevolan shrugged. " We can't hypnotise it, so now it's up to the chemists to synthesise something we can use to inject our commands into it." He wiped his face. " It's

made me wonder what would happen to any poor human being who fell into Enemy clutches—"

"None have," said Burma shortly. "All right, Gevolan. I'll give you the set-up. After that, it's up to you. I hope that search party of Magwareet's does find Wymarin—otherwise we'll be like a bunch of blind men trying to find a dark star in the Coal Sack !"

Gevolan stared, and then laughed. "I come from around there," he said. "I was evacuated from Arauk. We never used that simile, because it's a matter of record that a blind man *did* once find a dark star in the Coal Sack."

"I hope we have that kind of luck," said Burma flatly.

## XI

*The record of Johann Friedrich Schweitzer, called Helvetius, distinguished physician and respected citizen of The Hague:* "*The 27th of December,* 1666, *in the afternoon, came a stranger to my house . . . being a great lover of the Pyro-technian art* (*alchemy*) . . . *He gave me a crumb as big as a rape or turnip seed* (*of the Philosopher's Stone*) . . . *I cut half an ounce or six drams of old lead, and put it into a crucible in the fire, which being melted, my wife put in the said Medicine* (*the Stone*) . . . *within a quarter of an hour all the mass of lead was totally transmuted into the best and finest gold . . .*

"*I . . . did run with this aurified lead* (*being yet hot*) *unto the goldsmith, who . . . judged it the most excellent gold in the whole world.*"

Magwareet wished achingly for a second that he had all Artesha's resources at his command. This was too big a problem for any one man . . .

But he was responsible. He studied the time map for a long time before coming to his decision.

"Arafan !" he shouted, and the pilot's voice came back through the communicator. "Get us to Earth as quickly as possible !"

"At once," confirmed Arafan. Magwareet turned to look at a map of the land masses of Earth stuck on one wall, lettered in drastically abbreviated symbols. With one backward glance to make certain of the spot, he stabbed at it with his right forefinger. "Red ! Whereabouts is that in your time ?"

Red swallowed ; the tension of their venture close to the Enemy raider was still tight in his stomach. " It looks—" he began, and had to start again. " It looks like the middle of the Soviet Union !"

Magwareet nodded. " The Croceraunian Empire grew up from the wreckage of what you knew as China and Mongolia. We know more about them than we do about their predecessors, but there has always been something puzzling about their fantastically rapid expansion." He frowned. " They had a sort of bastard science which they treated as magic, but it gave them results . . . I've read their scriptures—they speak of miracles and being able to see into the future."

Arafan's voice broke in on them. " We're at the edge of atmosphere," reported the pilot baldly.

" Trace still there ?" Magwareet said, and the technician beside the time map confirmed it. " Coming up !" he shouted, and made for the control cabin.

The sight from the viewport was awe-inspiring. They could see the vast spread of the Eurasian land-mass dotted with clouds like smears of dirty white paint. The terminator between night and day was creeping towards the area for which they were making.

" Are we screened ?" Magwareet said absently, and Arafan noddcd. " Okay, take her down. It shouldn't be hard to spot what we're looking for—if I know anything about those Croceraunians, they couldn't be in one place for ten minutes without starting a fight."

It was eerie to swoop across the country whose reputation for secrecy and unapproachability had supplanted that of Tibet, looking at what might be the greatest secrets of all, unnoticed and uninterrupted.

" There !" said Magwareet at last, and pointed. A column of lorries loaded with armed men was tearing along a poor road at the limit of safety. " Another few miles and—yes, that's it !"

Circling under Arafan's deft touch, the ship surveyed the whole scene of battle. It was clear even to Red and Chantal, who knew nothing of military strategy : the ring of oddly-clad barbarians, many of them sheltering behind dead horses like Indians in a Western film, was standing off an army. Every now and again there was a puff of fire which did something indistinguishable but fatal to the Russian infantry.

"But there are so few of them!" said Chantal. "Can they really do much damage?"

Magwareet answered wryly, "They're carrying probably the finest portable weapons ever developed—sonic guns, atomic grenades, and what they call the Breath of Terror—a sort of universal catalyst which accelerates natural oxidation. Look, there goes one of the tanks."

There was only a drift of mist, but the wind brought it up to the side of the tank, and in a moment it had flared brilliantly into dust. A man carrying a clumsy pack got up and ran twenty yards before dropping behind a rise and repeating the process on another tank.

Arafan swore; they had noticed nothing, but he explained, "Being screened has its disadvantages! An aircraft nearly collided with us, going like lightning!"

"What are you going to do about this?" Chantal demanded practically, and Magwareet gave her a slight sad smile. "I have a job for you and Red. I'm sorry to say it, but you're—comparatively—expendable. We carry no weapons, and it would be useless to signal one of the ships that came after us to destroy the Enemy raider—their armament is just too powerful. It would take half the countryside with it.

"I'm going to ask you to go out there—screened, so that you're invisible—pick out the Croceraunians, and beat them over the head. It will be dangerous, because I don't think the screens will protect you against either the Breath of Terror or a high-velocity bullet. I must be candid—it's either you, or an indispensable technician."

Red looked at Chantal. "Me, I'll go willingly," he said. With the new-found clarity in his mind, he could tell that his urge sprang from the fact that now he was a whole man he wanted to match himself against other men—violently if need be.

Chantal looked doubtful. "Do you think I'd be any good?" she said. Magwareet laughed.

"Take these," he said, unscrewing two heavy insulated handles from a master control panel; each was about two feet long, very light and strong, with the upper and terminating in a hard, resilient grip three inches round. "And take these too." He held out pairs of goggles made of smoky grey plastic.

"With these you'll be able to see each other and the ship. *No one else can.* But they will hear you if you talk, or notice footprints in soft ground— . . .

"We'll bring the ship down to about ten feet and hover above you. Knock out your men and leave them—we'll pick them up, put them in storage and figure out what to do with them later."

Red dropped the ten feet to the ground, rejoicing in the equal strength of his two legs. He turned and broke Chantal's fall for her, and found himself suddenly staring at her with open eyes for the first time.

Like himself, she was now wearing the ubiquitous coverall which was the human race's standard costume of the time. But her face was flushed with excitement and nervousness, and her brown hair was ruffled round her pretty head. Her right hand was clasped round the improvised club Magwareet had given her, and there was something purposeful in her entire appearance.

He realised that he had been feeling, without noticing, the same air in the women he had met since his fantastic adventure took him with Burma over three thousand years of time—something utterly different from the women he had known in his own day. This was a woman who was a partner, an equal, knowing her own capabilities and willing to make the most of them.

He had barely time to absorb the knowledge when the sharp snap of a rifle reminded him that they were in the middle of a battle.

"Down!" he said under his breath, and they dropped side by side into the slight dip which was the reason for their being put down there. He looked up first, seeing their ship gigantic over them, and then searched the ground for a sign of the Croceraunians.

They did not have to look far. Moving with the skill of a practised warrior, one of the barbarians dodged from a piece of cover which Red thought could not have concealed a mouse, and fell over them in an attempt to gain fresh protection.

The man's mouth was already opening in a scream of fear at finding invisible demons on the ground when Red, having no time to club the man, jabbed him in the midriff and took the breath out of him before bruising his knuckles under his jaw.

"One!" he said with deep satisfaction, and they moved out across the ground.

Whispered directions from the door of the ship were essential to their success, for the Croceraunians had taken cover from aerial observation as well as surface spotters. They moved cautiously round the perimeter of the defences, knocking men out one by one.

Fortunately, the Russian attackers, slow to realise that the barbarians were in fact gone, not lying quiet in ambush, did not close in at once. Scientifically, enjoying the effort of pitting themselves against the Croceraunians whose military expertise would more than have matched the advantage conferred by invisibility if they had caught on, Red and Chantal carried on.

But it was getting dusk when there was nothing left except the little group of three at the very centre of the ring who would be the captain of the war party and his second and third in command.

" Red !" Magwareet whispered urgently. " We've spotted big aircraft heading this way ! You'll have to clean up the rest quickly—I suspect they're going to bomb."

Chantal drew in a quick breath.

" Okay," nodded Red. He felt very tired, but oddly exhilarated. " I reckon we can run most of the way. Look, Chantal—see that knob of ground ? Keep behind it, and drop when you get there."

On the last word he started forward, keeping low. The ship sidled tidily after them.

It was getting dark, but the three remaining Croceraunians were keeping a stern look-out. The noise of Red's awkward arrival brought one of them sharply to his feet, and after he had looked round and seen nothing, he ordered one of his companions to scout the sound.

Nothing could have been more convenient. Red's club rose and fell on the back of the man's neck the moment he was hidden from the others.

And a howl filled the air. A jet aircraft diving . . . !

There was the sound of rapid explosions, and the ship over them staggered, exactly like a man who has had a blow. Red's goggles had slipped a little, and he was amazed to look up and find that he could see the retreating plane quite clearly *through* the ship without them. The magnitude of the technical achievement shook him.

Another plane dived, and another, and the two surviving Croceraunians raised small weapons and fired on it with no effect, of course, for they were hitting the screens of the hovering ship. Red found a stone and threw it to one side, distracting their attention ; with a gesture to Chantal, he rose and ran down the slope.

But tiredness slowed them both, and at the sound of their feet the barbarians swung round. It was very nearly dark now, and they obviously felt prepared to take on opponents they couldn't see. He thought for a horrible instant that Chantal had been hit, but she had only stumbled, and then he was on his own man in a tangle of arms and legs.

The man was strong, and an able fighter, but the moment he realised he could not see his antagonist he faltered long enough to let Red club him.

Rising, Red looked round for Chantal. She had been less lucky ; her man, who had an air of authority, had set his jaw grimly and was throwing punches by guesswork—she had knocked his weapon flying with her club. One of them connected just as a further blast of cannon shells hammered on the ship above, and Chantal staggered back. At the same moment a Russian sniper found that the Croceraunian, who was of course not screened, was visible to him, and a bullet whined off a rock into the air.

Still backing, Chantal's foot found the outstretched leg of a man who had been lying on the ground since before the struggle started. She fell to the earth.

The Croceraunian's next blow found only air ; off balance, he too lost his footing, and Red was on top of him. In a moment, he was ready to be hauled aboard the ship with the rest of his war party, leaving only corpses marked with Russian bullets behind. An explanation would be found for them—somehow.

Red picked up one of the clumsy packs holding the Breath of Terror—it would not do to let *that* fall into twentieth century hands !—and prepared to start back into the ship. He looked round for Chantal, and saw her kneeling by the man she had fallen over.

" Are you all right ?" he demanded anxiously, and she nodded.

" Red, I thought this man was dead. He's breathing ! And look—he's no more than a boy ! He's pretty badly hurt, but I think we can fix him up. Help me get him aboard."

As they had moved Burma, they lifted him together. The memory of that first meeting made him wonder if it could really have been so recently, as he counted time. He felt as if he had been a different person then, and that it was ages ago.

Finally they scrambled through the airlock into the ship, and Magwareet was smiling at them.

"That was great work and quicker than I expected," he said warmly. "Do you know it's only been two and a half hours?"

"I feel tired enough to have been working for a week," said Red, wiping his forehead.

"I'll have that put right," said Magwareet. "We're already moving away from that place, you know," he added as an afterthought. "Now we've straightened out that mess, we can get on with our real job. Through there you'll find a washplace. Clean up, and when you're through come to the control cabin—I'll fix your tiredness for you."

He went out, and Red and Chantal followed his directions into the washroom. It was small, but there were two basins and two of the quick, efficient hot-air driers that had supplanted towels—there was always air available, but cloth was precious.

The water—re-cycled, absolutely pure, and just the right temperature—soaked the weariness out of their pores. Turning away after drying his face and hands, Red found himself looking straight at Chantal.

"You're—you're quite a person, aren't you?" he said awkwardly. "You seemed to take better to that job than I did, for a start."

"I suppose my job makes me ready for anything," she answered with a faint smile. "And I had done almost the same sort of thing before—I was in the French Resistance when I was twelve! But you did better than I did, really."

There was a pause. Red went on, "I'm surprised I believe in what's happening, you know. Thrown into a completely strange world—"

The words touched something deep in Chantal's mind. Her face twitched, and she was suddenly clinging to him, seeking support and comfort. "It's terrifying!" she whispered. "Red, I'm so glad you're here too—on my own, I'd go mad!"

He stroked her hair as she pressed her face against his shoulder. "I know what you mean," he said with deep sincerity. "And I'm glad not only because I've got someone

else from my own world for company—but because the someone is someone like you."

She raised her head and looked at him, and at that it seemed quite natural for him to kiss her.

" Do you know something?" he said tenderly when they drew apart again. " I've always been afraid to do even that ! I was so scared that a woman might pity me and pretend not to, I didn't dare do that !"

" They've given you a lot, haven't they—Magwareet and Burma and their people ?"

" So much," said Red steadily, " that I'll do anything and everything I can to recompense them."

## XII

*Anchor team, Burma speaking, emergency : Any team engaged in investigation of possible communication with the Being—any team having data on patterns of response of the Being—any team having any relevant information notify at once !*

*Defence fleet (co-ordinates* 902634111) *speaking : Suggest investigation of possibility that Enemy found in city from* 129 *Lyrae and captured entered Solar System owing to writhing of Being. Artesha's opinion, please.*

*Centre, Artesha speaking : We cannot rule out the possibility that the Being itself is being* used *as a weapon by the Enemy—nor, in fact, that it is an artificially created weapon. Probability low, but existent.*

" So that definitely removes all signs of temporal displacement from this period?" Magwareet said disappointedly. The technicians nodded. " All right, where are the secondary peaks of this surge ?"

" We've come so far in time that our instruments are too fogged with surplus energy," the girl with dark hair standing by the time map told him. " There's a chance we could pick up a single individual if we matched times with the secondary peak which came up about three hundred years ago. We can't do it directly from here. The only other important peak of this surge is the one which broke up the anchor team we were chasing—remember ? I don't think Wymarin would have stood a chance if he'd been caught in that."

" All right," said Magwareet firmly. " Let's go see. And if we can't pick him out, then we'll just have to land and build outselves new equipment out of matter that isn't overloaded with temporal interference !"

" Meantime," said the girl calmly, " how about this cargo of barbarians we've just acquired ?"

" Could I do anything about them ?" asked Chantal, entering with Red just in time to catch the remark. " I was a nurse back where—back when I came from. Maybe I could help fix them up ?"

" Fine," agreed Magwareet, after a slight hesitation. " Tesper ! If you'd just give Chantal a brief run-down on the medical equipment aboard . . . ? "

" Surely," nodded a small man with his hands full of scribbled notes. " In just a moment."

Arafan's voice came down to them from the communicator. " We're just going into the surge again, trying for the secondary peak ! I'll call you as soon as we emerge."

" Thank you," acknowledged Magwareet. " Now I'll see to you, Red and Chantal—might as well grab the chance of a meal while we're going through the surge, at that."

Fed, and remarkably refreshed after a quick course of the hypnotic and anti-fatigant treatment which had added the sleeping time to the thinking time of the human race, Chantal accompanied Tesper through the ship to the place where forty Croceraunian barbarians lay almost literally heaped up. The ship was large, but the crew's quarters were cramped, and Tesper insisted that the medical equipment was hopelessly inadequate. To Chantal, it was a dream.

It took her barely ten minutes to learn the use of the regenerant and healing devices, how to administer the universal antibiotics they had met before, and how to dress wounds with the soothing plastoskin that did the job of a bandage and a skin graft in one. She would dearly have liked to learn *how* the devices worked, but that was for later.

Oddly, her ' barbarian ' methods—though they startled Tesper—came in extremely useful. The equipment was not in fact up to dealing with forty injured men, some badly hurt, but there was plenty of clean water—limited only by the speed with which it could be re-cycled and purified—and with splints and clean rags supplementing more modern techniques, she went steadily ahead.

The Croceraunians were all finely muscled young men in their thirties, she guessed, except the captain, who was older, and the young man whose legs she had fallen over at the very end of their cleaning-up operation. He—as she had remarked—was no more than a boy, perhaps eighteen.

She lingered longest over him, wondering who he was. His hands and arms were heavily tattooed with complex designs, and she puzzled over their possible meaning. At length, however, giving a final glance round to see all her charges were as comfortable as possible, she returned to the main technical room.

They had emerged from the temporal surge while she was below, and she discovered Magwareet consulting worriedly with his assistants.

"What is it?" she inquired, and Red, who was standing beside Magwareet, broke away and came over to her.

"We've reached the limit our equipment can stand," he said. "Even if Wymarin is down there, we can't detect him because the screens are fogged. There's only one thing for it—we've got to figure out a way of building new machinery. How?" he added, turning to Magwareet.

The co-ordinator frowned. "You told me a moment or two back you were no expert in history. The fact remains, you certainly know more about this period than I do, and I can't compute with data I don't possess. What's our best chance of making use of such scientific knowledge as there is?"

Red whistled. "Chemistry was the only science that had begun about this time! This is the mid-seventeenth century, isn't it?" The idea brought a chill of awe. "Even that was strictly trial-and-error. They're refining metals—some metals—down there. Is that any help?"

"A bit. I had the computers run off the specifications for a thoroughly jury-rigged detector that will serve our purpose. All right, we'll have to try it. Where do you suggest? England was fairly advanced, I believe. Is—?"

"England's out. I speak twentieth-century English, and they'd suspect something funny. No, it'd better be somewhere where I can pass as a foreigner and still get away with speaking only English. And we'll have to go very carefully—I don't know to how great an extent a chemist or alchemist is regarded as a witch in these days. On the whole, I'd make a guess and say that a fair-sized town in Holland would be a reasonable bet."

" Settled," said Magwareet. " Arafan !" He gave directions to the pilot.

" Clothing—money—an interpreter—ouf, this will be a long job !" Red said ruefully. " Still, I suppose it's quicker than starting from scratch."

Chantal came up to him as he watched the European coast swell in the viewports. " Red—you'll be careful, won't you ?"

" Of course," he said sincerely, and clasped her hand.

But it was with trepidation that she watched him and Magwareet, carefully screened, drop from the ship and wave goodbye before setting out along a poor-surfaced road towards the flourishing township of The Hague.

" Now we have nothing to do but wait," said Tesper. " I have the oddest feeling, you know, that if only our screens were clear we'd have no trouble. I'm certain Wymarin is actually here ! I can't see there's anywhere else for him to be."

" Except several trillion cubic miles of empty space," put in the dark-haired girl by the time map, and Tesper was forced to nod agreement. But he shuddered as he did so.

" How are the barbarians ?" he asked, turning to Chantal.

" As well as can be expected." She pushed out the cliche with no apologies. " There's one of them that interests me, though."

" They're all interesting," Tesper answered dryly. " The Croceraunian Empire is one of the most enigmatic phenomena of history ! But which, in particular ?"

" The very young one. He has tattoo marks all over—"

Tesper looked startled. " Can you describe them ?" he said urgently, and Chantal blinked.

" Well, it'd be easier if you came down and looked," she began, but Tesper was already on his way.

She caught up with him as he was looking round and attempting to spot the tattooed boy. " Over there," she indicated, and Tesper hurried across the room. After a quick survey, he breathed a delighted sigh.

" What fantastic luck ! Chantal. there's always been one outstanding puzzle about the Croceraunians—what their ' magic ' was besides bastard atomic science. Right here we have a chance to find out. This boy was the war party's magician !"

Chantal digested that in silence for a moment. Tesper went on enthusiastically, " Back before the war I'd have given my arm for a chance like this. Now I can only make the most of it. I was a social historian, you see, before I was put on to the temporal survey side. Can you wake the boy up ?"

Chantal nodded, and reached for a percutaneous syringe charged with a stimulant. Meantime, Tesper fetched a chair and sat down comfortably alongside the boy's bunk.

After a pause the eyelids fluttered, and then he looked straight into Tesper's face. There was no sign of fear or astonishment in his reaction, and he asked a question.

There was something very attractive about his complete self-possession, and Chantal, though she could not understand what he said, felt herself warm to him at once. Tesper glanced up.

" This is remarkable ! He wants to know if he's in a metal bird—he must mean an aircraft ! How could he tell ?" Stumblingly, he phrased a sentence in the strange tongue, and the boy answered.

" His name's Vyko, and he's the magician of the war party, as I guessed. It's his first time out. He says he told the captain that a powerful magic had sent them elsewhere in time—to the Old Days. But *how can he tell* ?"

Fascinated, Chantal watched silently, occasionally venturing to interrupt and ask what was being said. She could gather only that Vyko remembered being shot, and accepted their healing him as a matter of course. But he had assumed they were powerful magicians themselves, and his terms for understanding the universe were so alien that even Tesper, who had studied the history of his time, had trouble with them.

And then he said something which made Tesper sit up and exclaim, " What is it ?" demanded Chantal.

" He's talking about looking into time ! He claims he can see the future. This is wonderful . . . Chantal, I don't know if anyone's told you, but we of my time have a wider perception of now than your people had. I can shift my attention *within* a single instant of now—backwards and forwards. We often tried to find where that came from. Obviously, it was a mutation from the atomic war. That accounts for the fantastic rise of the Croceraunian Empire ! With extra temporal perceptors, perhaps specially bred, they could overcome any opposition."

This was too much for Chantal. She seized on the one important fact, surprised to find herself so vehement about it. "Ask him if Red and Magwareet will get back safely."

A brief exchange : then, "He can't tell. He doesn't know who they are, or anything about this time he's in. But he can tell that nothing is going to happen to harm him in the near future—that's why he's so calm and sure of himself.

"Chantal, this means that the human race can have four-dimensional awareness, and if it wasn't for the risk of monkeying with history and changing it, we'd have the perfect key to communication with the Being right in the palms of our hands."

## XIII

*Extract from an address to the opening session of the British Society, June 1st, 1974 : "When the sum total of knowledge about the universe is finally collated into one grandiose all-embracing Encyclopaedia—and incidentally when the human race has lost its reason for continuing to exist (loud applause)—then the history of scientific endeavour will probably be divided into three sections . . .*

*"The first naturally, will cover the period in which men—having learned they were capable of formulating ideals—attempted to construct idealised schemes for the cosmos. We might instance the Ptolemaic version of the Solar System . . . The second would deal with the growth of such disciples as relativity, and man's attempt to comprehend the actual workings of the universe . . .*

*"The third would be the period whose opening date may well be some time in this year of 1974 ! It would be the period in which man admitted that the universe's rules obey laws which to us must inevitably appear as capricious as the untrammelled whim of a human being . . ."*

Magwareet carried his unaccustomed costume off with an air of distinction, but Red found it uncomfortable and awkward. He fidgeted under the stern gaze of the landlord.

"So yuh meester Komm from Muscovy?" the fat man said. "An' yussef?"

"I've spent a long time there," said Red carefully. The landlord's knowledge of English was scanty enough, and his seventeenth-century accent—though unexpectedly close to

some dialects of twentieth-century American—added to the problem. " My master is a student of the philosophical art which men call alchemy."

" Dis gold—ist alchemic ?" The landlord rapped one of the thalers they had given him in payment for their accommodation. Red shook his head.

" Alchemical gold," he improvised, " is mystical and not to be used in trade."

The landlord looked relieved, but Red noticed that he put their payment in a separate bag from the rest of the money in his coffer. Turning back to them, he said, " An' yuh vant wat ?"

" My master wishes to meet and speak of alchemic matters with the learned men of this city."

" Den go see Meester Porelius. Iss de assay-meester of de kinglich court. EE'ull zendt my apprentist to guide."

He went out, and Red looked at Magwareet. " Are you getting what he says ?" he asked.

Magwareet nodded. " What was the office of this man he wants to send us to, though ?"

" Assay-master—if I heard him right. That means he's an inspector of currency, and probably an expert in the chemistry of metals. I think we've struck lucky first time."

He glanced down at himself ruefully. " I'm supposed to be used to this kind of costume, but you, who are supposed to come from a barbarian country, look much more at home in it !"

There was a knock at the door, and a small boy put his head in. " This will be our guide," Red commented—they were talking Speech, chancing anyone meeting them who knew what Russian actually sounded like. " Shall we go right away ?"

" The less time we waste the better," said Magwareet, with a grave expression befitting an adept in th epyrotechnian art. " Lead the way, little one !"

They followed the boy out into the narrow crowded streets which they had already traversed on their way into the town. They had managed to obtain samples of clothing and money while invisible, and having returned to the ship had duplicated them. Properly equipped, they had set out. But two previous days had gone already, and they were only beginning their task.

Passing men laden with goods, men selling fresh water from barrels, itinerant vendors of needles, distinguished citizens

with attendants, rough artisans, slatternly women, they were predominantly conscious of one thing—a stink which was almost nauseating. Magwareet suffered even worse than Red. The reason was perfectly plain, of course—from upper storey windows maidservants were casually tossing night slops into the streets, horses padded through the muddy pools leaving the inevitable signs of their passage, and the inhabitants themselves were blithely and un-selfconsciously unaware of the values of public sanitation. The most resplendently dressed people they met were scratching themselves for lice.

"This is a civilised country?" said Magwareet meaningly as they paused to let a couple of packhorses precede them down a tiny alleyway, and Red shrugged.

"I see what you mean," he agreed. "Unpromising, isn't it?"

The house before which they finally halted was plainly that of a well-to-do citizen, but—like the majority of those in the town—owing to infirm foundations it was very slightly, but noticeably, on the skew. Their little guide, brushing his hair back with a quick gesture, stretched on tip-toe and raised the knocker.

A pretty young maidservant opened to them, and on hearing their errand, stood back smiling to let them enter. They hesitated on the threshold because of the state of their feet, but there were already muddy marks on the wood floor, and Red remembered that he had heard somewhere of a complaint about the Dutch custom of never wiping one's feet.

They followed the maid into a large, well-furnished room, where she invited them to sit down. Red, after some difficulty —but he was getting used to Dutch by now—discovered that Meester Porelius was out at the moment on some mission, but was due back shortly.

He relayed this to Magwareet. "He's gone to see a goldsmith called Brechtel—as far as I can gather, about some alchemical business. So it seems we're really in luck."

They had not long to wait. Meester Porelius came in in less than ten minutes, with a companion, talking at the top of his voice. Red listened carefully, but caught no more than that something was fantastic and incredible.

Within a short while Porelius himself entered and, bowing to them, invited them to state their business.

" My master," said Red, pleased to find that Porelius spoke good English, " is a learned man of Muscovy, by name Andreev, and we desire to meet and discuss matters concerning the pyrotechnian art and mystery—"

Porelius expanded like a flower in the sun, and called for wine to be brought. " Then you will be delighted and amazed to learn that in this very city at the moment is the most remarkable adept in that art who ever existed !"

" Really ?" said Red, glancing at Magwareet, who was preserving his dignity with difficulty.

" Yes, indeed !" exclaimed Porelius. " I have myself been at the silversmith's this morning, submitting to the test of fire some alchemic gold which was transmuted by Meester Helvetius, physician to the Royal Court of Orange, using some of the Philosopher's Stone which was given to him as a token by a certain Meester Elias some few days ago."

" And the gold stood the test ?"

" Most surely. More than that, I saw that it itself had some of the wonderful virtue of the Medicine used on it. For in my presence, gentlemen, I saw it transmute a full dram of silver into gold."

Porelius sat back with a self-satisfied air, and the maid poured wine and brought it to them. Red was so startled that at first he hardly noticed the girl waiting at his side.

" And this—Meester Elias who has the Stone," he said at length. " What manner of man is he ?"

" That I cannot fairly say," admitted Porelius, " for I myself have not seen him. But I have it from Meester Helvetius that he is a small man, beardless, with black hair, and that he is said to be founder of brass who was taught the Art by an outlandish friend."

Red seized the chance with both hands. " This outlandish friend—perchance he came from Muscovy ?"

" It is possible. Know you this Elias ?"

" Not certainly. But a fellow adept of my master has travelled to this part of Europe before, and has recounted that he met one pupil especially apt to learn. Now that I bethink me of it, his name might full well have been Elias. If it is indeed the same, my master would much desire to have discourse with him."

Porelius chuckled, and held out his mug for more wine. " He is not alone ! I too crave that, as does everyone who witnessed the transformation that took place this morning.

We have already criers out to know where he lodges, but no man knows him."

Red's heart sank, but he was puzzled beyond measure to know what sort of person this mysterious Elias might be. If he was indeed able to transmute metals, he would be an Incredibly valuable contact.

There was the chance of trickery, naturally—Red had heard of the astute charlatans who duped whole groups of people with pretended transmutations—but Porelius struck him as a level-headed type, and certainly, if he was the equivalent of Master of the Mint, he could not be deceived in the testing of precious metal.

Fired by his new audience, Porelius continued to enlarge on what he had seen, and the idea in Red's mind grew to a certainty. Elias was their man.

But how to find him ?

The best they could do was to extract a promise that Porelius would notify them if anyone found Elias ; meantime, he promised to introduce them to such experimenters in the Art as there were at The Hague. With that, they departed.

Then there began a dreary round of meetings with half-sensible, half-bemused mystics and serious but misguided experimenters. Helvetius himself they met, and heard his story—it convinced them completely that Elias was the person they were after. No one else had even the remotest chance of being useful to them. They simply lacked the necessary scientific discipline ; their work was confused and muddled with so much esoteric jargon that both sides concluded that their new acquaintances were incompetent.

And still there was no sign of Elias.

Red began to doubt that such a person existed, but Magwareet, oddly enough, was perfectly ready to accept both his ability and his actual transmutation.

" It is entirely possible to transmute metals chemically," was the upsetting remark he made when Red taxed him. " I don't see why you're so distrustful !"

" Well, then—*how*, for goodness sake ?"

" The nearest analogy is by saying it's a biological process," frowned Magwareet. " Certain atomic patterns have the property of reduplicating themselves inder the right conditions, and it doesn't take the energy of a cyclotron or one of those other early nuclear devices to force the reaction. But it took

the combined resources of most of Centre's computers to determine those conditions, and the one thing that does bother me is whether anyone would really have been silly enough to set them up by accident !"

Slightly heartened, Red pursued his search.

They had been there so long, that they were almost used to the smell when, one morning, as they were setting off to meet yet another of these experimenters who might help them, they passed a small man in a dark fustian coat, who walked along the muddy road unattended and with downcast eyes. Magwareet looked at him, looked away, and then turned back with most undignified haste.

"Wymarin !" he shouted, and the little man halted and came back with all the self-possession in the world.

"Thank goodness you showed up," he said mildly. "I thought I was going to have found nuclear physics from the bottom up in order to get home." He looked at them inquiringly. "You don't seem very surprised to see me, I must say."

Red waited long enough to make sure he had his breath back, and then spoke equally mildly. "I suppose you're Elias," he said disgustedly.

"Of course. Where's the ship? I must get back—I've got something very important to tell Artesha."

## XIV

*"Am I my brother's keeper ?"—Cain, the brother of Abel whom he slew . . .*

*"No man is an island !"—John Donne, cleric, sensualist and master of the English language . . .*

*One might think that Jung's simile comparing individual consciousness to islands poking up through the surface of a sea, contradicted that, but nonetheless the islands were indivisibly connected through the bed of the ocean.*

*And yet somewhere under that was knowledge. Which of these was neighbour to him that fell among thieves ?*

Chantal noted that Red still limped, automatically, in moments of stress as they entered the miraculous door leading to any part of Centre's complex of ships. And it was a moment of stress. truly—their first meeting with Artesha had been no more than one in a long series of incredible happenings, but

now they knew the nature of that—ex-woman? The phrase rang suspiciously true—they felt awe.

And yet there was nothing beyond the door except that same small room, warm and softly lit. In it, Chantal fancied she could sense *presence*.

There were chairs waiting. Magwareet took one immediately and spoke up. "Artesha!"

"I'm listening," said the detached mechanical voice.

"I'll give you a brief run-down on exactly what we've done, first of all. Then Wymarin should be along—he went straight away to give the details of his last experiment to Burma. And Tesper brought up something in connection with one of the barbarians which I think is very important."

"All right. Go ahead."

It took Magwareet less than five minutes to give a complete account of their trip, and at the end of it Artesha gave a satisfied sound.

"We had a fantastic stroke of luck—finding Wymarin the way we did," ventured Red.

"I wonder," said Artesha thoughtfully. "Wymarin doesn't think so."

"What?" The three of them—Red, Chantal and Magwareet—hunched forward as if jerked on strings.

"Wymarin—I'm monitoring his report to Burma—believes that he succeeded in getting through to the Being, and although the reflex he stimulated did toss him off into time the Being did its best to control the movement and make certain he survived."

They digested that in silence for a moment. Then Magwareet heaved a huge sigh. "Is it true?" he asked.

"I'll leave that to Burma to settle for the time being. I've told him that as soon as Wymarin has given him the information required, he's to try and repeat the experiment with a little less force. I'm ordering out as many anchor teams as we can spare to help hold down the temporal surge if he stimulates one. Here comes Wymarin now."

The door slid aside and admitted not only the little dark-haired man whose alchemical achievements had amazed seventeenth-century Holland, but also Tesper. They greeted Artesha, and sat down.

"Well, Burma is going ahead," Wymarin informed them. "We can expect results in one form or another within a few hours.

" Briefly, what I did was this. I've been struggling for more than ten years now to deduce by pure logic what an intelligent creature existing in four dimensions would recognise as a significant pattern. I had a great deal of help from Kepthin's team, but the one which seems to have been successful was entirely my own idea.

" So I set up a wave-pattern which was symmetrical in four dimensions, and then modulated it in accordance with a number system derived from the co-ordinates of the world lines of the major planets. We already knew that the Being could detect radiant energy—witness the way it keeps away from the sun. I think, though, that I did it too powerfully—the shock actually harmed and pained the Being. But I am absolutely certain it recognised conscious intention behind what I did, and moreover knew that I, not the rest of my team, was responsible. So it looked after me."

He sat back looking pleased with himself.

" There's something fundamentally wrong with your ideas," said Red suddenly, looking astonished at his own temerity. Magwareet and Wymarin glanced at him, startled.

" Excellent," said Artesha. " Go on, Red—what makes you so sure ?"

" Well . . . Put it this way. I know how hard it is to get across even to another human being a meaningful statement, even in terms of language. I found that back in my own time —I knew what I was trying to convey when I modelled a figure or statuette, but a good half the time people misunderstood what I was trying to indicate." He was warming to the thesis.

" I just can't see that you could get across to a creature whose entire existence has nothing in common with ours, anything based on—for example,—number, which is a product of our idea of time-flow. One precedes two, two precedes three, and so on—"

" No, you're wrong there," Artesha broke in. " Wymarin's mathematics is purely non-sequential. But I think your basic point is perfectly valid.

" Wymarin, we're beginning to break down the psychology of the specimen of the Enemy that we caught. Our only explanation of how he managed to penetrate our defences is that the Being is actually used by them. It may even be a weapon that they are only gradually coming to control. I want you to go down and see Kepthin and find out from him

if the psychological pattern he is constructing agrees in any important features with the one you postulate for the Being. If it is—"

"If it is," said Magwareet flatly, "we've got to lick the two together, or we're licked ourselves."

Looking thoroughly upset, Wymarin nodded and went out.

"How long do you think it'll take him to be doing useful work again after the break-up of his team?" asked Magwareet. "And have they recovered any more of the personnel?"

"No," said Artesha thoughtfully. "But I think he'll re-adapt quickly. He's collaborated with Kepthin before."

"What news is there of the fighting?" was Magwareet's next question.

"We're still pulling back. We took an Enemy fleet clear out of the sky—fifty-five ships—when they were pushing towards Tau Ceti. But I think we're going to have to evacuate there."

"That's horribly close to home," said Magwareet slowly.

"Much *too* close. Magwareet, I've tried and tried, but I can't see a way out. We could run, but there's nowhere to run to—the Enemy controls space in all directions away from the Solar System. And every time we pull back, we have fewer resources to draw on, less space to manoeuvre—" Artesha, for the first time Magwareet could recall, sounded as completely human as she had been before she so nearly died.

"There are still possibilities we haven't studied," he pointed out, trying to sound comforting. "Tesper, yours is very hopeful."

The ex-historian, who had been listening gravely to this exchange, leaned forward.

"Yes, it's this boy Vyko. You already know who he is, Artesha?"

"Staff magician to this Croceraunian war party you had to mop up. Yes, go on."

"Well, he holds the key not only to the problem of what made that Empire so phenomenally successful, but also to communication with the Being. if that's possible. Here we have someone who genuinely possesses a sort of four-dimensional consciousness. I haven't been able to get details yet, because his language—though I speak it fluently—is very

poorly suited to conveying the concepts. I'm having him given an intensive course of Speech at the moment."

"You'd better be careful none of the concepts he gets conflict with his ability," said Artesha.

"That's been attended to. Anyway, if there's a single person capable of identifying at all with the Being, he is the one."

"How does his extra-temporal perception work?"

"It isn't extrapolation. That we have found out. Any reasonably good computer can be adapted to prophecy if required—we do it all the time. No, his talent is under conscious control, although it extends more to emotions than actual events. He needs to know, or at any rate be associated with, the people he makes prophecies about, but details of their proposed course of action aren't needed, and he can make forecasts completely without knowledge of the circumstonces. He could, for example, forecast the probable fate of his war party when there had been no sign at all of an impending attack, though one was coming."

"How soon can we start making use of this talent?"

"He'll only have to get acquainted with Centre and the general situation, that's all."

"I could figure out by pure deduction what it is necessary for him to know," Artesha remarked pensively. "But I don't see why I should waste the time when we have two people who've been through much the same sort of thing. Red, Chantal—I have a job for you. I want you to take Vyko around Centre—anywhere you like—and tell him the things which you wanted to know when you arrived here. Let him get the feel of things. You won't have to give him complex scientific or mathematical knowledge—he's educated according to his standards. Maybe a brief summary of astronomical facts will be required. Do you think you can handle that?"

"No trouble," said Red confidently. "Except that we'll have difficulty finding our way around Centre."

"You won't. Time is valuable, so we designed Centre in a way that lets anyone at all find their way about after about half a minute's explanation. Magwareet will show you what I mean when we're through here."

**To be concluded**

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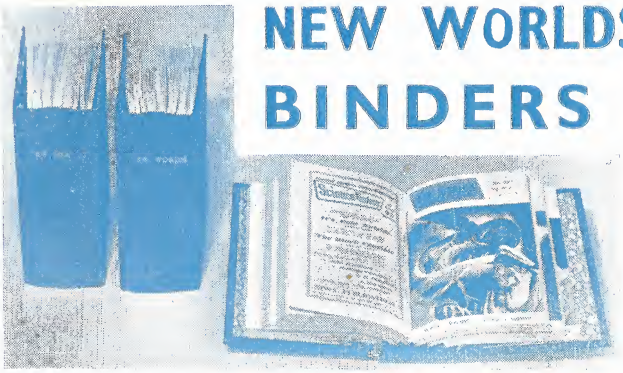

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